E-9722R Server

USERGUIDE

Gateway®

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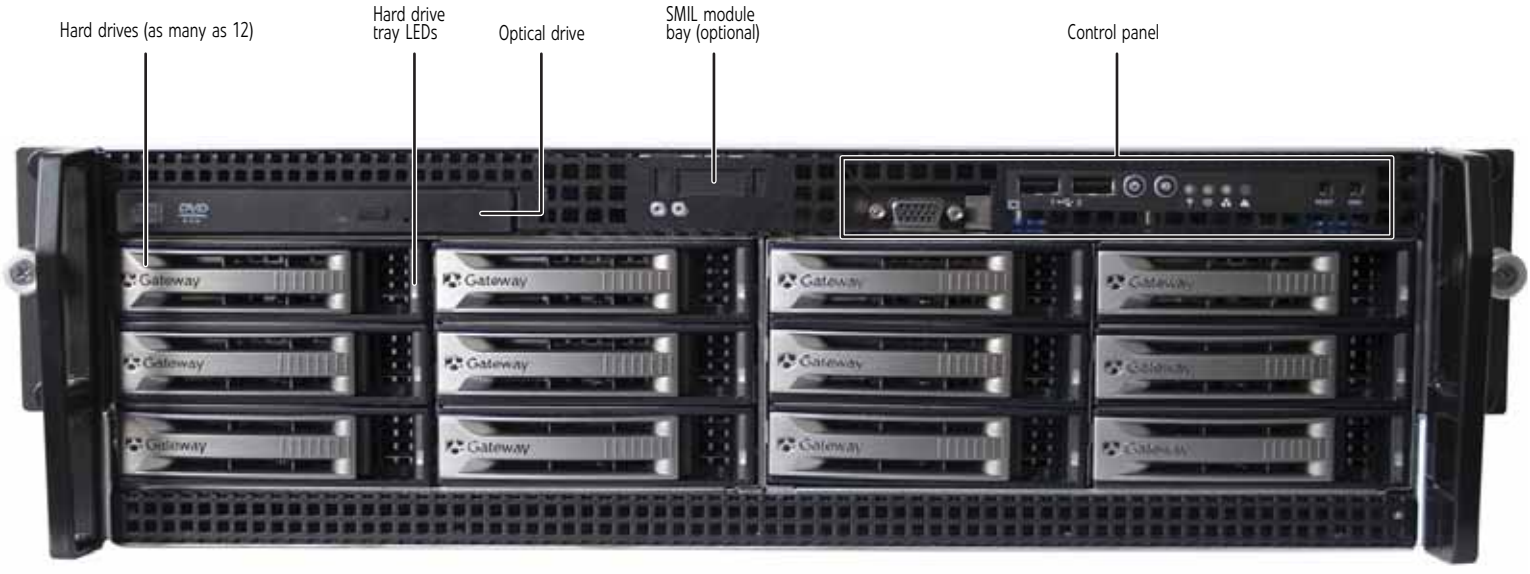
CHAPTER 1

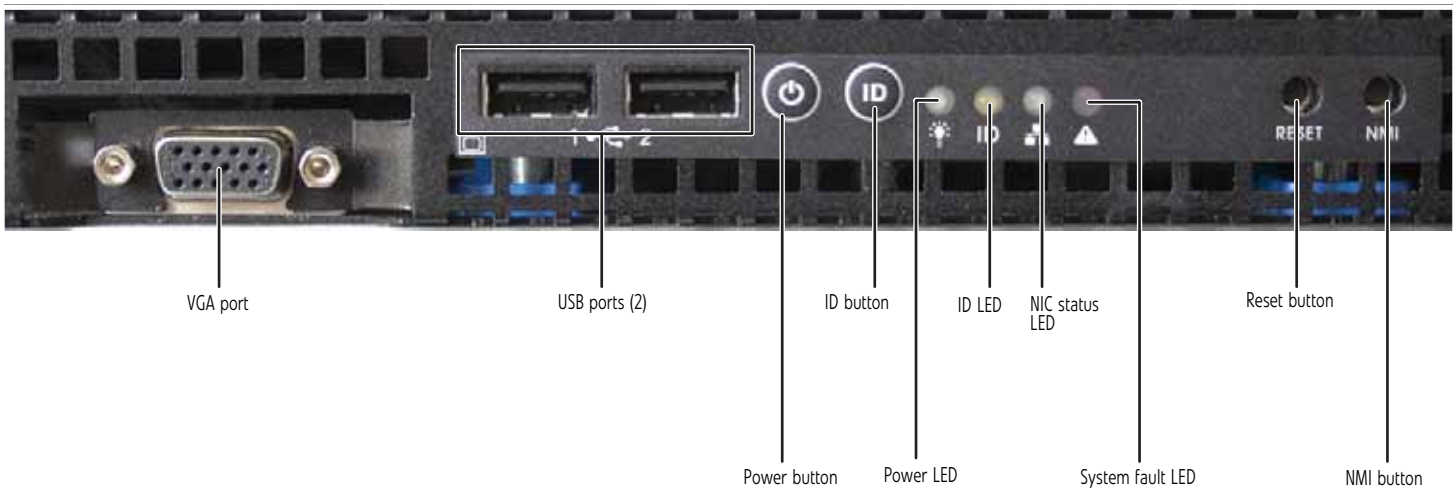
Checking Out Your Gateway Server

- Front
- Back
- Back
- Interior
- System board
- Hot-swap backplanes
- Getting Help

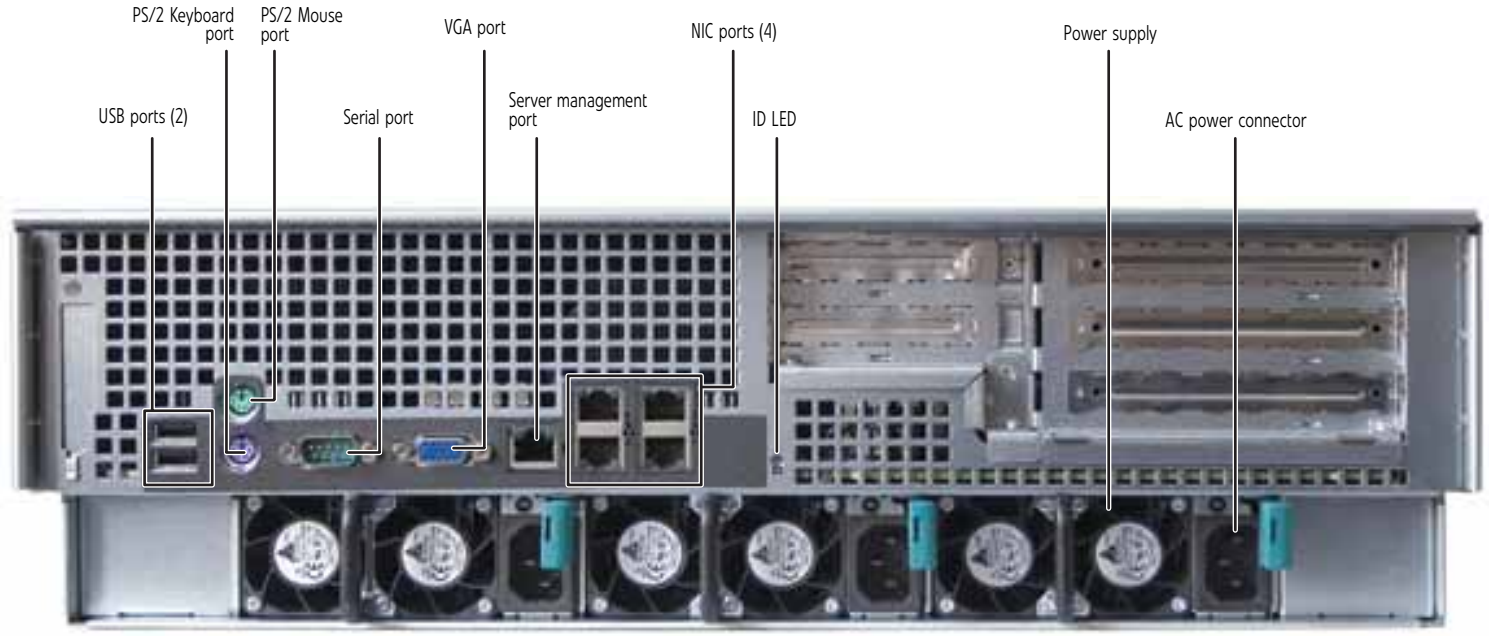
Front



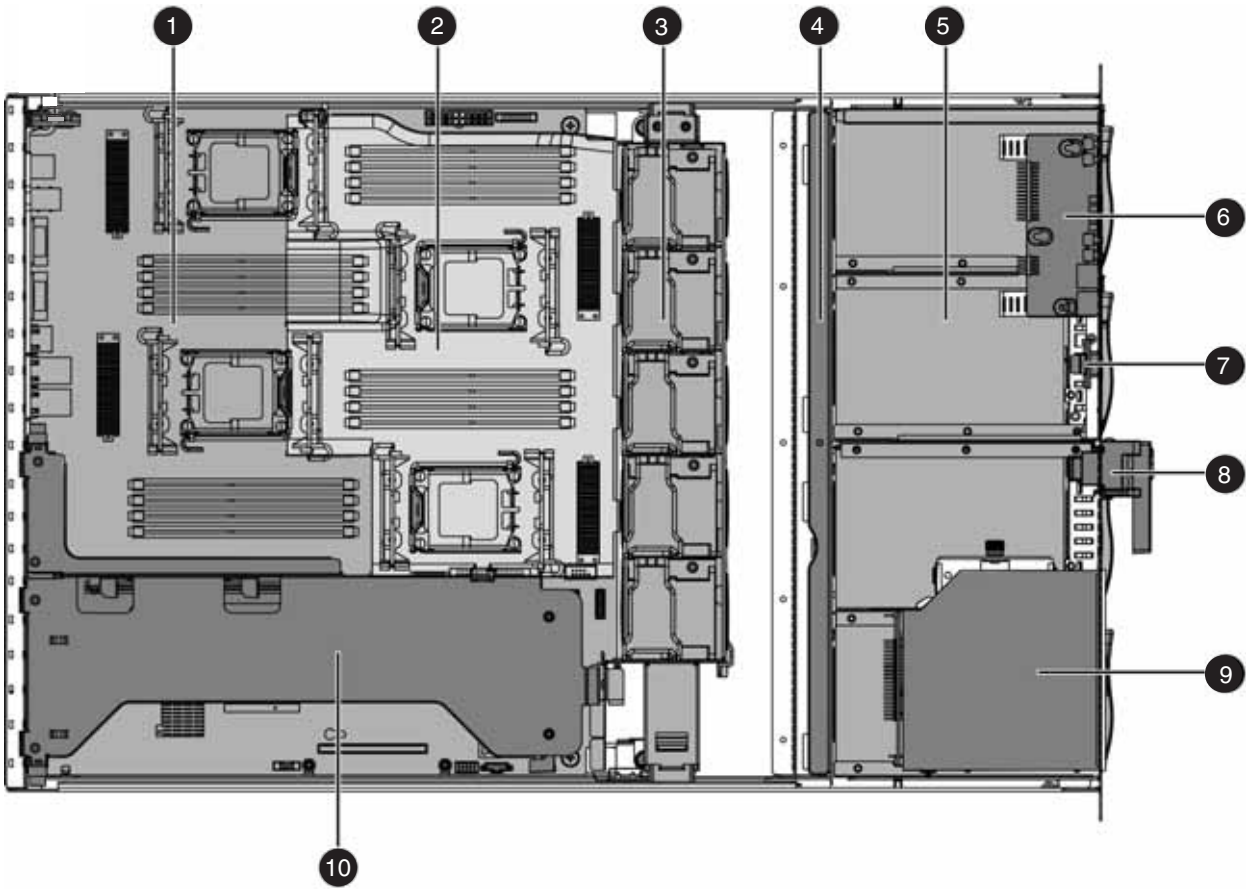
Control panel



Back


PS/2 Keyboard port
PS/2 Mouse port
VGA port
NIC ports (4)
Power supply
USB ports (2)
Serial port
Server management port
ID LED
AC power connector

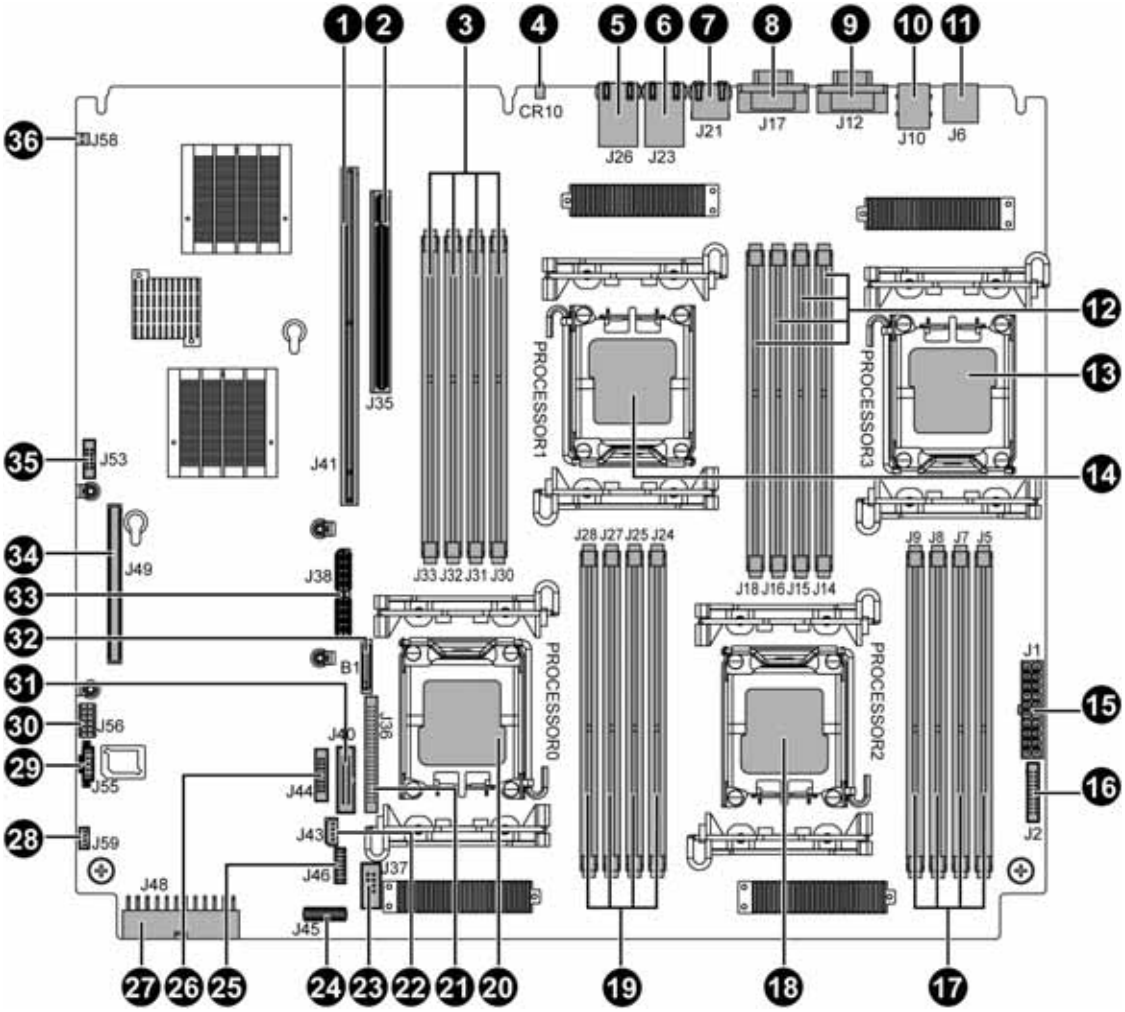
Interior



#	Feature	#	Feature
1	System board	6	Front panel
2	Fan duct	7	Front panel VGA connector
3	System fans	8	SMIL module (optional)
4	SATA II/SAS backplane	9	Slimline DVD/CD-RW combo drive or DVD-RW drive
5	Hard drive bays	10	Riser card assembly

System board

Connectors

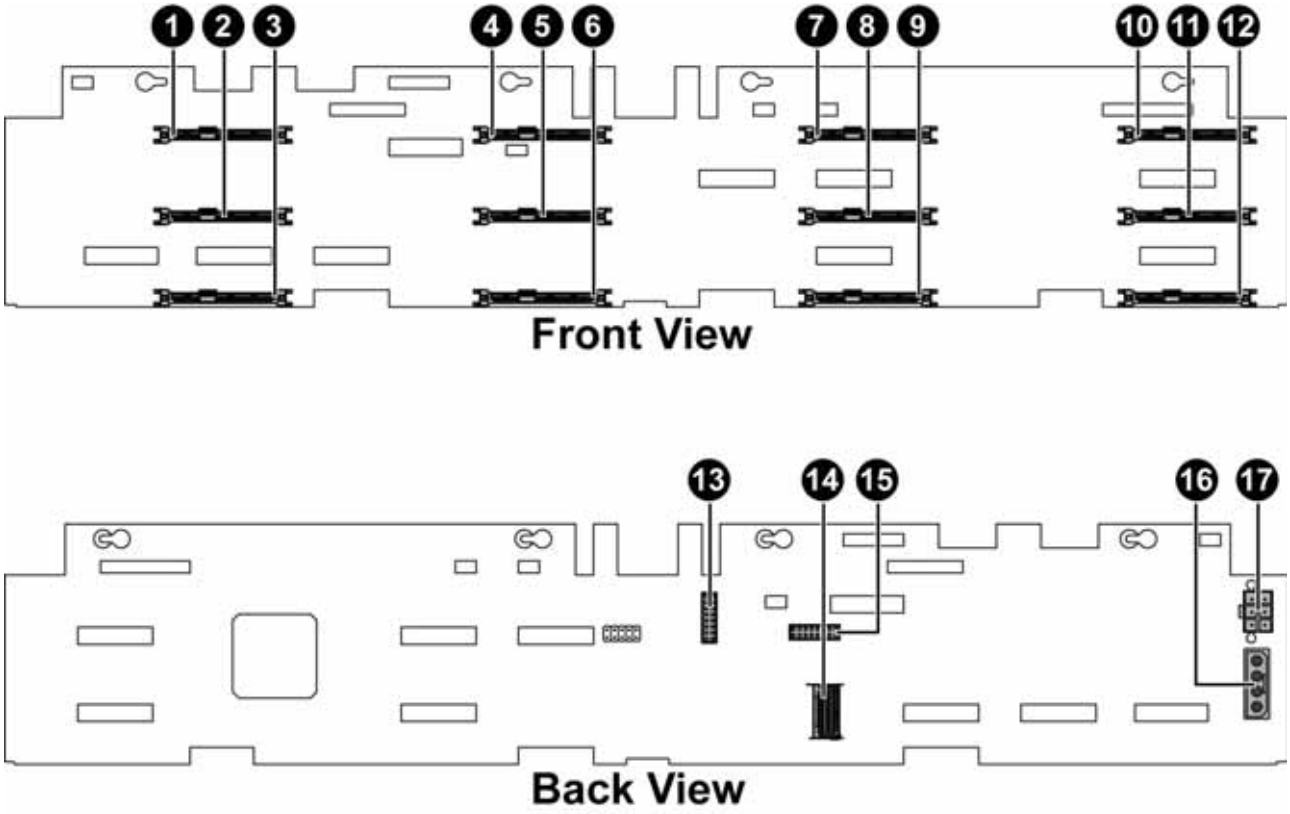


#	Feature	#	Feature
1	PCI-X/PCI-E expansion slot (J41)	19	DIMM socket group for processor 0 (J24, J125, J27, J28)
2	PCI-E expansion slot (J35)	20	Processor 0 (CPU0) socket
3	DIMM socket group for processor 1 (J33, J32, J31, J30)	21	IDE connector (J36)
4	ID LED (CR10)	22	IPMB connector (J43)
5	Dual NIC 2 and 3 connector (RJ-45) (J26)	23	SMIL connector (J37)
6	Dual NIC 0 and 1 connector (RJ-45) (J23)	24	Front panel connector (J45)
7	Server management port (RJ-45) (J21)	25	Front panel VGA connector (J46)
8	VGA port (J17)	26	I^2C (SMBus) signal connector (J44)

#	Feature	#	Feature
9	Serial port (J12)	27	Main power connector (J48)
10	PS/2 keyboard and mouse ports (J10)	28	Internal USB port for USB floppy (J59)
11	Rear dual USB Port (J6)	29	Power supply I^2C connector (J55)
12	DIMM socket group for processor 3 (J14, J15, J16, J18)	30	System configuration jumper (J56)
13	Processor 3 (CPU3) socket	31	Floppy connector (J40)
14	Processor 1 (CPU1) socket	32	Battery (B1)
15	Processor power connector (J1)	33	PCI-E mezzanine board connector (J38)
16	Fan tach connector (J2)	34	PCI-X mezzanine board connector (J49)
17	DIMM socket group for processor 2 (J5, J17, J8, J9)	35	Front panel USB connector (J53)
18	Processor 2 (CPU2) socket	36	Chassis intrusion connector (J58)

Hot-swap backplanes

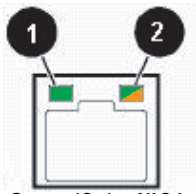
SATA II/SAS backplane



#	Feature	#	Feature
1	SATA II/SAS hard drive connector 0	10	SATA II/SAS hard drive connector 9
2	SATA II/SAS hard drive connector 1	11	SATA II/SAS hard drive connector 10
3	SATA II/SAS hard drive connector 2	12	SATA II/SAS hard drive connector 11
4	SATA II/SAS hard drive connector 3	13	I^2C (SMBus) signal connector
5	SATA II/SAS hard drive connector 4	14	Backplane SATA II/SAS connector
6	SATA II/SAS hard drive connector 5	15	3rd party connector
7	SATA II/SAS hard drive connector 6	16	1X4 pin hard drive power connector
8	SATA II/SAS hard drive connector 7	17	2x3 pin hard drive power connector
9	SATA II/SAS hard drive connector 8		

LED information

See the following table for a description of this server's LEDs and the information they provide:

LED Name	Function	Location	Color	Description
ID	Aid in server identification	Control panel and back of system board	Yellow (front) Blue (back)	On = Server identification enabled
System Fault	Visible fault warning	Control panel	Red	Off = System normal Blinking = Non-critical system fault On = Critical system fault (system needs to be shut down and serviced)
Hard drive tray LEDs	Indicate drive status and activity	On each hard drive tray	Blue or red	Blue (On) - Hard drive present Blue (Blinking) - Hard drive activity Red (On) - Hard drive fault Red (Blinking) - Hard drive rebuilding Off - No hard drive access
NIC status LEDs	Identify NIC states	Control panel and back I/O panel RJ-45 connectors	Blue (front)	Blue (On) - Link Blue (Blink) - Activity Off - No link
			Green/ Orange (back)	 LED 1 Green (On) - NIC linked LED 1 Green (Blinking) - NIC 1 Gbps activity LED 1 (Off) - No link LED 2 Orange (On) Link speed 1 Gbps LED 2 Green (On) - Link at 100 Mbps LED 2 Green (Off) - Link at 10 Mbps
Power LED	Identify the power state of the system	Control panel	Blue	Off = Power is off Blinking = Power saving state (S1, S3, or S4) On = Power is on
AC power LED	Identify power supply fault	Power supply module	Green or Orange	Green (On) - Power supply good and receiving power Orange (On) - Power supply critical event causing shutdown Orange (Blinking) - Close to protection threshold or over within 15 seconds Off - Power supply not receiving power

Getting Help

In addition to your operating system's documentation, you can use the following information resources to help you use your server.

Server Companion DVD

Use the *Server Companion DVD* to access file utilities, Windows Server 2003 drivers, and documentation for your server and its components. For instructions, see *Using Your Server Companion DVD*.

Gateway Web site

Gateway provides a variety of information on its Web site to help you use your server.

Visit the Gateway Web site at support.gateway.com for:

- Technical documentation and product guides
- Technical tips and support
- Updated hardware drivers
- Order status
- Frequently asked questions (FAQs)

Telephone support

You can access a wide range of services through your telephone, including customer service, technical support, and information services. For more information, see "Telephone support" on page 62.

CHAPTER 2
Setting Up Your Server

- Setting up the hardware
- Protecting from power source problems
- Starting your server
- Setting up the operating system
- Initial hardware settings

Setting up the hardware

To make sure that your working environment is safe:

- Use a clean, dry, flat, stable surface for your server. Allow at least 6 inches at the back of the server for cabling and air circulation.
- Use the instructions on your server's setup poster to set up your hardware.

Caution
Your server comes with 3-wire AC power cords fitted with the correct plug style for your region. If this plug does not match the connector on your surge protector, UPS, or wall outlet, do not attempt to modify the plug in any way. Use a surge protector, UPS, or wall outlet that is appropriate for the supplied AC power cords.

- Use a grounded (three-prong) surge protector. A surge protector helps protect against AC power fluctuations. For additional protection from power outages, we recommend that you use an uninterruptible power supply (UPS).
- Avoid subjecting your server to extreme temperature changes. Do not expose your server to direct sunlight, heating ducts, or other heat-generating objects. Damage caused by extreme temperatures is not covered by your warranty. As a general rule, your server is safest at temperatures that are comfortable for you.
- Keep your server and magnetic media away from equipment that generates magnetic fields, such as unshielded stereo speakers. Strong magnetic fields can erase data on both diskettes and hard drives. Even a telephone placed too close to the server may cause interference.

Important
Keep the server boxes and packing material in case you need to ship the server.

Protecting from power source problems

Surge protectors, line conditioners, and uninterruptible power supplies can help protect your server against power source problems.

Surge protectors

Caution
High voltages can enter your server through the power cord and the modem and network connections. Protect your server by using a surge protector. If you have a modem, use a surge protector that has the appropriate type of modem jack. During an electrical storm, unplug the surge protector and the modem and network cables.

During a power surge, the voltage level of electricity coming into your server can increase to far above normal levels and cause data loss or server damage. Protect your server and peripheral devices by connecting them to a surge protector, which absorbs voltage surges and prevents them from reaching your server.

When you purchase a surge protector:

- Make sure that the surge protector meets the appropriate product safety certification for your location, such as Underwriters Laboratories (UL).
- Check the maximum amount of voltage the protector allows to pass through the line. The lower the voltage, the better the protection for your server.
- Check the energy absorption (*dissipation)* rating. The higher the energy absorption rating, the better the protection for your server.

Line conditioners

A line conditioner protects your server from the small fluctuations in voltage from an electrical supply. Most servers can handle this variation, called *line noise,* without problems. However, some electrical sources include more line noise than normal. Line noise can also be a problem if your server is located near, or shares a circuit with, a device that causes electromagnetic interference, such as a television or a motor.

Some surge protectors and uninterruptible power supplies include simple line-conditioning capabilities.

Uninterruptible power supplies

Use an uninterruptible power supply (UPS) to protect your server from data loss during a total power failure. A UPS uses a battery to keep your server running temporarily during a power failure and lets you save your work and shut down your server. You cannot run your server for an extended period of time while using only the UPS. To buy a UPS, visit accessories.gateway.com.

Starting your server

Before you start your server for the first time:

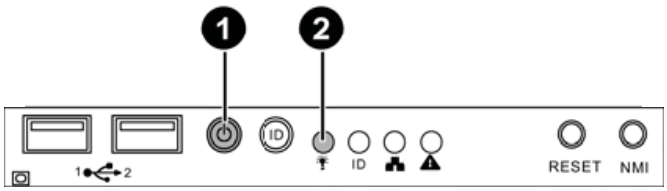
- Make sure that the server and monitor are plugged into a power outlet or surge protector and that the surge protector (if you are using one) is turned on.

  Caution
  When you connect peripheral devices to the server, make sure that your server and devices are turned off and the power cords are unplugged.

- Make sure that all cables are connected securely to the correct ports and jacks on the back of the server.

▶ **To start the server:**

1. Turn on any peripheral devices connected to the server.
2. Press the power button (1). The Power LED (2) lights.



If nothing happens when you press the power button:

- Make sure that the power cable(s) is plugged in securely and that your surge protector (if you are using one) is plugged in and turned on.
- Make sure that the monitor is connected to the server, plugged into the power outlet or surge protector, and turned on. You may also need to adjust the monitor's brightness and contrast controls.
- If you cannot find the cause of the power loss, contact Gateway Customer Care. For more information, see "Getting Help" on page 9.

3. The first time you turn on the server, any pre-installed operating system may begin asking you for configuration settings. See your operating system's documentation for instructions on configuring advanced settings for your specific network.

■

Understanding the power-on self-test

When you turn on your server, the power-on self-test (POST) routine checks the server memory and components. If POST finds any problems, the server displays error messages and issues audible beeps. Write down any error messages that you see, then see "Error messages" on page 63 and "Beep codes" on page 67 for troubleshooting information.

Turning off your server

Every time you turn off your server, first shut down the operating system. You may lose data if you do not follow the correct procedure.

▶ **To turn off the server:**

> **Caution**
> The power button on the server does not turn off server AC power. To remove AC power from the server, you must unplug the AC power cords from the wall outlet or power source. The power cords are considered the disconnect device to the main (AC) power.

1. See the operating system's documentation or online help for instructions on shutting down the operating system. Whenever possible, you should use the operating system's shut down procedure instead of pressing the power button.
2. If your server did not turn off automatically, press the power button.

   - OR -

   Press the reset button to reset the server.

■

Setting up the operating system

If you ordered your server with the operating system already installed by Gateway, in most cases it is completely installed and the basic settings are already configured. The Windows Small Business Server operating system may require additional installation, depending on the version you ordered. See your operating system's documentation for instructions on completing the installation or configuring advanced settings for your specific network.

If you are installing an operating system because it was not already installed by Gateway, see the appropriate installation guide for instructions.

Initial hardware settings

Your server comes from the manufacturer with the correct initial hardware settings to operate your server as configured. However, at some point you might want to change settings to reflect a tasking change, a change in security requirements, or the addition of new resources to your server.

You can change general hardware settings by using the BIOS Setup utility. For information on the BIOS Setup utility, see "Using the BIOS Setup Utility" on page 53. For information on BIOS settings, see "BIOS Settings" on page 87.

CHAPTER 3
Maintaining Your Server

- Caring for your server
- Preparing for system recovery
- System administration
- Identifying your server
- Updating the baseboard management controller firmware
- Using your Server Companion DVD

Caring for your server

To extend the life of your server:

- Be careful not to bump or drop your server.
- When transporting your server, we recommend that you put it in the original packaging materials.
- Keep your server and magnetic media away from equipment that generates magnetic fields, such as unshielded speakers.
- Avoid subjecting your server to extreme temperatures. Do not expose your server to heating ducts or other heat-generating objects. Damage caused by extreme temperatures is not covered by your warranty. As a general rule, your server is safest at temperatures that are comfortable for you.
- Keep all liquids away from your server. When spilled onto server components, almost any liquid can result in extremely expensive repairs that are not covered under your warranty.
- Avoid dusty or dirty work environments. Dust and dirt can clog the internal mechanisms and can cause the server to overheat.

Cleaning your server

Keeping your server clean and the vents free from dust helps keep your server performing at its best. Your server cleaning kit could include:

- A soft, lint-free cloth
- Glass cleaner
- An aerosol can of air with a narrow, straw-like extension
- Isopropyl alcohol
- Cotton swabs
- A tape drive cleaning cartridge (if a tape drive is installed)
- A CD drive cleaning kit

Cleaning tips

Warning
When you shut down your server, the power turns off, but some electrical current still flows through your server. To avoid possible injury from electrical shock, unplug the power cords and all other cables connected to the server.

- Always turn off your server and other peripheral devices before cleaning any components.
- Use a damp, lint-free cloth to clean your server and other parts of your server system. Do not use abrasive or solvent cleaners because they can damage the finish on components.
- Keep the cooling vents free of dust. With your server turned off and unplugged, brush the dust away from the vents with a damp cloth, but be careful not to drip any water into the vents.

Cleaning the keyboard

You should clean the keyboard occasionally by using an aerosol can of air with a narrow, straw-like extension to remove dust and lint trapped under the keys.

If you spill liquid on the keyboard, turn off your server and turn the keyboard upside down to let the liquid drain. Let the keyboard dry completely before trying to use it again. If the keyboard does not work after it dries, you may need to replace it. Keyboard damage resulting from spilled liquids is not covered by your warranty.

Cleaning the screen

Caution
The computer screen is made of specially coated glass and can be scratched or damaged by abrasive or ammonia-based glass cleaners.

If your computer screen is an LCD display, use only a damp, soft cloth to clean it. Never spray water directly onto the screen.

- OR -

If your computer screen is not a flat panel display, use a soft cloth dampened with glass cleaner to clean the screen. Never spray cleaner directly onto the screen.

Preparing for system recovery

If you have a diskette drive installed, you can create startup diskettes to help you recover. *Startup diskettes* are diskettes that let you start the server and attempt to fix the problem. See your operating system's documentation or online help for instructions on creating startup diskettes. If your system files become corrupted, you can use the diskettes you created to start your server.

If you have an optical drive, you can also create a bootable CD or DVD to help you recover. In addition, you can also use a bootable Disk-on-key in any of the server's USB ports. Your server's BIOS must be set up to poll the optical drive and USB ports for bootable files.

Some operating systems also let you create an emergency repair diskette, CD, DVD, or Disk-on-key to back up critical operating system files. See your operating system's documentation or online help for instructions on creating and using an emergency repair discs.

Recording the BIOS configuration

To help keep track of your custom changes to BIOS settings and to prepare for system recovery, you should record your BIOS configuration after you have your server set up and working. You should also record your BIOS configuration whenever you upgrade or add new hardware to your server.

▶ **To record your BIOS configuration:**

1. Print the appendix for "BIOS Settings" on page 87.
2. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Record the BIOS settings on your printout.

■

System administration

Gateway Systems Manager

Gateway Systems Manager (GSM) lets you manage multiple computers on a Windows network from a single window, then implement commands and policies across the network with a single action. With Gateway Systems Manager, you can run system management tasks which are triggered by certain events or conditions.

For more information, refer to the *Gateway Baseboard Management Controller (BMC) User Guide* at support.gateway.com (by selecting this server from the list). You can also find additional information in the program's online help.

Server security

Locking the server

▶ **To lock the server:**

1. Remove the bezel lock keys from the inside of the bezel, then snap on the bezel. The handles must be installed for the bezel to snap on.
2. Insert the key into the lock and rotate it ¼ turn clockwise. To unlock it, rotate the key ¼ turn counter-clockwise.

■

Using BIOS security passwords

To prevent unauthorized use of the server, you can set server startup passwords. Set an administrator password to prevent unauthorized access to the BIOS Setup utility.

▶ **To set the BIOS security passwords:**

1. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
2. Select the **Security** menu.
3. Select **Change Supervisor Password**.
4. Type the password and press **ENTER**, then type it again and press **ENTER**.
5. Save your changes and close the BIOS Setup utility.

■

▶ **To remove a BIOS security password:**

1. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
2. Select the **Security** menu, then select the password to remove.
3. Enter the current password, then press **ENTER**.

Tip

Passwords can also be cleared using jumpers on the system board. For instructions, see "Resetting BIOS passwords" on page 57.

4. For the new password, leave the password field blank, then press **ENTER**. The password is removed.

■

Identifying your server

Important

If your server has an Intel IMM module installed, the system ID LED will turn on or off when the System ID button is pressed. If no IMM Module is installed, the system ID LED will blink when the System ID button is pressed.

While you are working on a cabinet that contains several slim servers, it can be difficult to keep track of which server or servers you are currently working on. The System ID indicator is a yellow LED (front) or blue LED (back) that you can turn on to help you locate the correct server. For the System ID indicator to turn on, the server does not need to be turned on, but it does need to be plugged in.

To turn on the System ID indicator:

1. Press the ID button on the control panel of the server. The yellow (front) and blue (back) ID LED indicators turn on. For the location of these LEDs, see "LED information" on page 8.
2. To turn off the indicator, press the System ID button.

■

Updating the baseboard management controller firmware

The baseboard management controller (BMC) performs several system management functions such as:

- Monitoring server components (FRU) and sensor data records (SDR) (the information provided depends on the option selected)
- Managing non-volatile storage for the system event log and sensor data records
- Interfacing with the emergency management port to send alerts and interact with remote management systems
- Fault resilient booting (the extent depends on the option selected)

You should update the BMC firmware when Gateway Customer Care has instructed you to update it.

To update the BMC firmware:

1. Download the BMC firmware zip file from support.gateway.com.
2. Read the release notes for the firmware update.
3. Follow the instructions on the Web site or in the readme.txt file in the downloaded zip file to update the firmware.
4. When the BMC update is complete, reboot your server.

■

Using your Server Companion DVD

You can use your *Server Companion DVD* (SCDVD) to:

- Install hardware drivers
- Install programs
- View server documentation

The *Server Companion DVD* is a tool you can use to help maintain your server. The DVD contains:

- Computer and component documentation
- Drivers and utilities for servers running Windows 2003 Server

Viewing documents

The DVD contains documents for your server and for some optional components. You can view the documents with the Acrobat® Reader® version 4.0 and above.

▶ **To view documents:**

1. Insert the *SCDVD* into the DVD drive on a computer running the Windows operating system. The *Gateway Application and Driver Recovery* window opens.

   - OR -

   If the window does not open, run the file **Runmenu.exe** on the DVD.

2. Click **Documentation**. The server document list opens.
3. Click the title of the document you want to view. The document opens.

   To access files manually, open the **Docs\Manuals** folder on the *Server Companion DVD*.

   ■

▶ **To install Acrobat Reader 7:**

- Click the link for Acrobat on the Documentation page.

  - OR -

  Run **Docs\Reader\app21279\Setup.exe** from the *Server Companion DVD*.

  ■

Installing drivers and programs

You can install drivers and programs directly onto the server by using the *Server Companion DVD*. You can also extract drivers onto diskette from the DVD at any Windows workstation.

Important
The SCDVD's Gateway Application and Driver Recovery utility works only in Windows operating systems.

▶ **To install drivers and programs at the server:**

1. Insert the *SCDVD* into your server's DVD drive. The *Gateway Application and Driver Recovery* window opens.

   - OR -

   If the window does not open automatically, run the file **Runmenu.exe** on the DVD.

   A list of programs and drivers that you can install appears in the Drivers and Application Recovery list.

2. Click the program or driver you want to install, then click **Install**. Follow any on-screen instructions.

   ■

To access the files manually, open the **Drivers** folder on the *SCDVD*, then open the appropriate subfolder.

To extract drivers and programs to diskettes:

1. Insert the *SCDVD* into your server's DVD drive. The *Gateway Application and Driver Recovery* window opens.

   - OR -

   If the window does not open automatically, run the file **Runmenu.exe** on the DVD.

2. Click **Extract Drivers.**
3. Click your server model and server operation system at the right of the window, then click **Search**. A list of programs and drivers with which you can create recovery disks (diskettes, CDs, DVDs, or Disk-on-keys) appears in the Drivers and Application Recovery list.
4. Click the program or driver you want to extract, then click **Extract**. Follow any on-screen instructions.

■

To access the files manually, open the **Drivers** folder on the *SCDVD*, then open the appropriate subfolder.

Booting from the Server Companion DVD

By booting from the *SCDVD,* you can repair applications and drivers or exit to the command prompt.

Important
Although the SCDVD is bootable, it does not include network operating system files and is not intended to restore your operating system.

To boot from the SCDVD:

1. With your server turned on, insert the *SCDVD* into the DVD drive.
2. Restart your server. A message appears asking you to select an option.
3. Press any key to boot from the DVD. The *Gateway Options Main Menu* appears.
4. Follow any on-screen instructions.

   You can use the options in this menu to reformat your hard drive, create mass-storage driver disks, or reload selected applications.

■

CHAPTER 4
Installing Components

- Preparing to install components
- Preventing static electricity discharge
- Opening the server case
- Closing the server case
- Installing and removing drives
- Installing memory
- Installing and removing PCI expansion cards
- Replacing system fans
- Replacing or adding a processor
- Replacing a power supply module
- Replacing the power distribution module
- Replacing the hot-swap backplane
- Replacing the CMOS battery
- Replacing the control panel
- Replacing the system board

Preparing to install components

Selecting a place to work

Work on your server in an area that:

- Is clean (avoid dusty areas).
- Is a low-static environment (avoid carpeted areas).
- Has a stable surface on which to set your server.
- Has enough room to place all of your server parts.
- Is near a grounded outlet so you can test your server after installation.
- Is near a telephone (in case you need help from Gateway Customer Care). The telephone must be directly connected to a telephone jack and cannot be connected to your server.

Gathering the tools you need

Tip
Blue latches, thumbscrews, or connectors indicate tool-less components. Green latches and connectors indicate hot-swappable components.

Some tools and supplies that you may need to work on your server are:

- A notebook to take notes
- A Phillips screwdriver
- A small flat-blade screwdriver
- Small containers to store various types of screws
- A grounding wrist strap (available at most electronic stores)

Getting Help

If you have questions about performing any of these procedures, contact Gateway Customer Care. For more information, see "Getting Help" on page 9.

Preventing static electricity discharge

Warning
To avoid exposure to dangerous electrical voltages and moving parts, turn off your server and unplug the power cords and modem cable before opening the server case.

The components inside your server are extremely sensitive to static electricity, also known as *electrostatic discharge* (ESD).

Caution
ESD can permanently damage electrostatic discharge-sensitive components in the server. Prevent ESD damage by following ESD guidelines every time you open the server case.

Before working with server components, follow these guidelines:

- Turn off the server, then unplug the power cords and all other cables.

  Important
  If you are replacing a hot-swappable system fan, you do not need to turn off the server or unplug the power cord(s) and other cables.

- Press the power button to drain any residual power from the server.
- Wear a grounding wrist strap (available at most electronics stores) and attach it to a bare metal part of the server. You can also touch a bare metal surface on the back of the server with your finger.

- Avoid static-causing surfaces such as carpeted floors, plastic, and packing foam.
- Avoid working on the server when your work area is extremely humid.
- Remove components from their antistatic bags only when you are ready to use them. Do not lay components on the outside of antistatic bags because only the inside of the bags provide electrostatic protection.
- Always hold expansion cards by their edges or their metal mounting brackets. Avoid touching the edge connectors and components on the cards. Never slide expansion cards or components over any surface.

Warning
To prevent risk of electric shock, do not insert any object into the vent holes of the power supply.

Opening the server case

Warning
This server may have two power cords. To disconnect internal AC power, you must unplug both power cords.

Because the components inside your server are extremely sensitive to static electricity, make sure that you follow the instructions at the beginning of this chapter to avoid static electricity damage.

▶ **To open the server:**

Warning
Screws are required to support the front of the server when using the standard cabinet rails. You must support the server while removing the front screws and while sliding the server off the cabinet rails. If the server is not supported, damage to the server or injury may result.

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

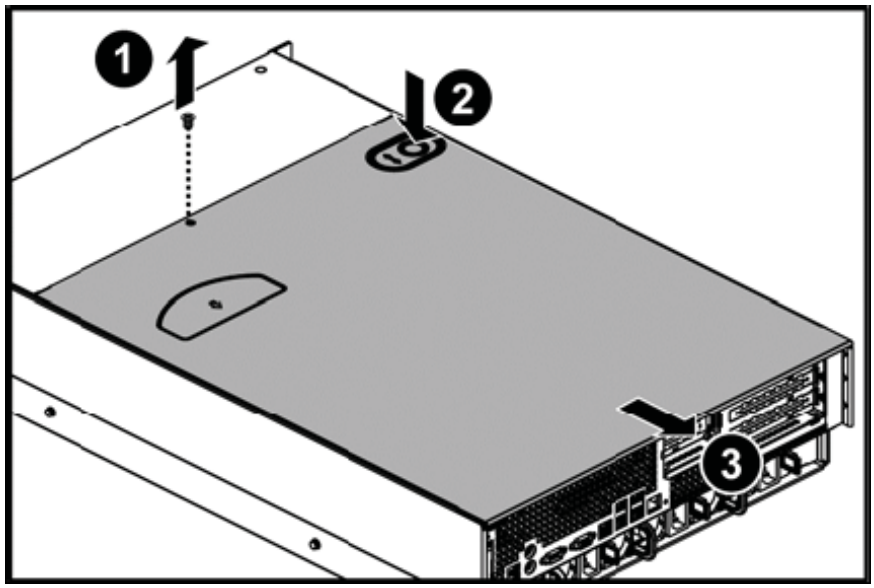
   Important
   If you are replacing a hot-swappable system fan, you do not need to turn off the server or unplug the power cord(s) and other cables.

2. If the bezel is installed, unlock it, then pull it off.
3. If the server is mounted in a cabinet, remove it from the cabinet.
4. Place the server on a stable, non-skid surface.

5 Remove the screw (1) at the front of the top cover, then press and hold the release button (2).

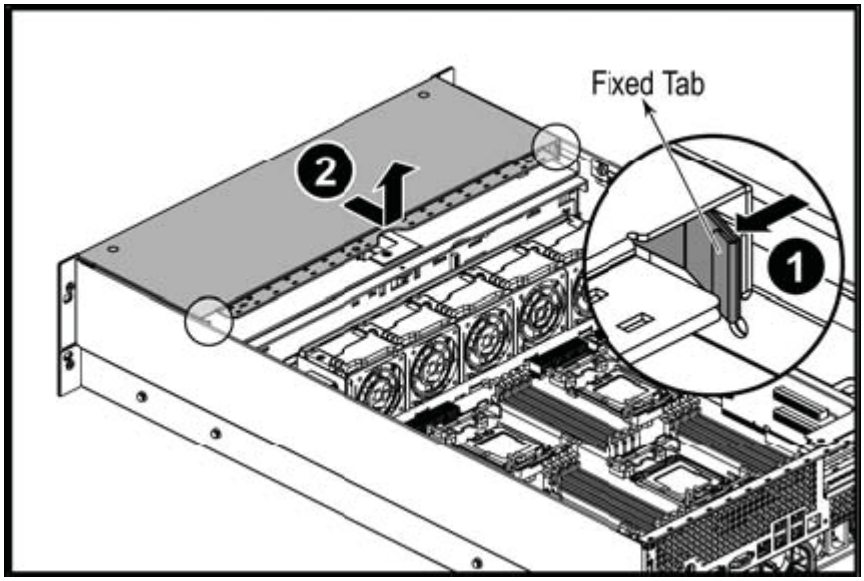
Caution
For correct cooling and air flow, always reinstall the top covers before you turn on the server. Operating the server without the covers in place will cause the server to overheat.

Important
The hard drive carriers shown in these illustrations may look different than the actual hard drive carriers in your server.



6 Slide the top cover (3) toward the back of the case, then lift it off the case.

7 Move the fixed tabs (right and left) toward the middle of the server, then slide the front top cover (2) toward the back of the server and lift it off.



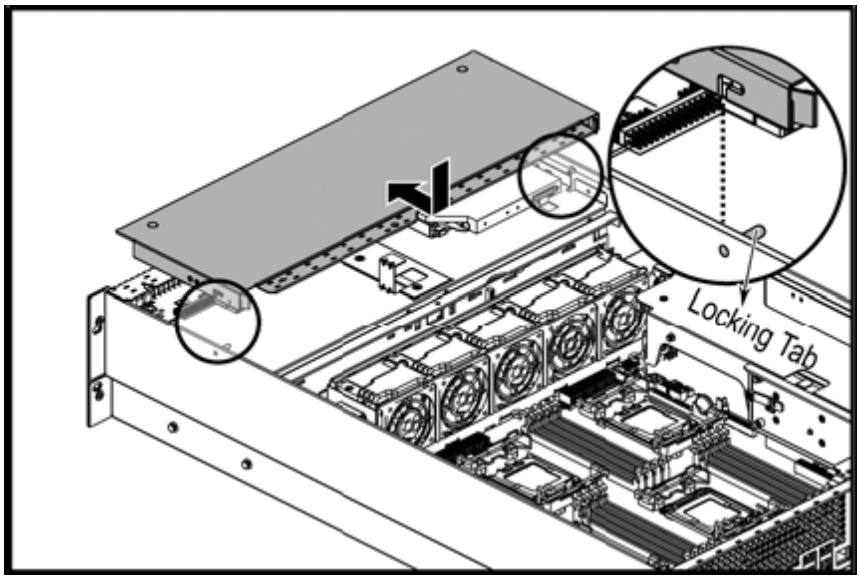
■

Closing the server case

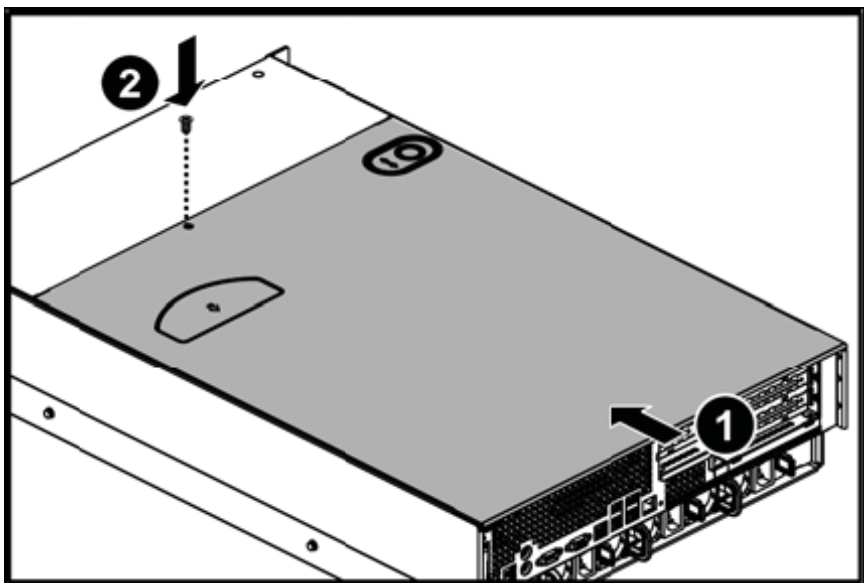
To close the server case:

1. Make sure that all of the internal cables are arranged inside the case so they will not be pinched when you close the case.
2. Place the front top cover on the server, then slide it forward until it clicks into place.

Important
The hard drive carriers shown in these illustrations may look different than the actual hard drive carriers in your server.



3. Place the back top cover on the server, then slide it forward (1) until it clicks into place. Replace the screw (2) to hold the top cover in place.



4. Reconnect the power cords and all other cables.

■

Installing and removing drives

Your server's basic configuration includes one optical drive and as many as twelve SAS/SATA hot-swap hard drives.

As you prepare to install drives, remember:

- Before you install a drive, see the drive's documentation for information on configuring the drive, setting drive jumpers, and attaching cables.
- You may need to configure the drives you install using the BIOS Setup utility. Press **F2** at startup to open the BIOS Setup utility.

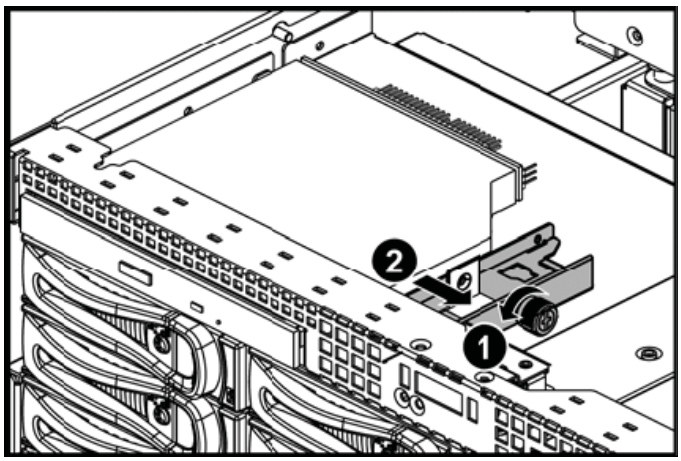
Removing and installing an optical drive

Caution
The optical drive is not hot-swappable. Before installing or removing the drive, make sure that power is turned off and the power cord(s) is unplugged.

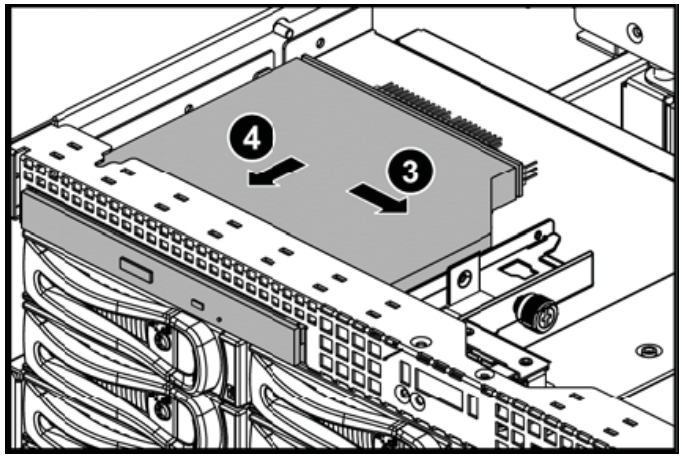
▶ **To remove and install an optical drive:**

Important
The hard drive carriers shown in these illustrations may look different than the actual hard drive carriers in your server.

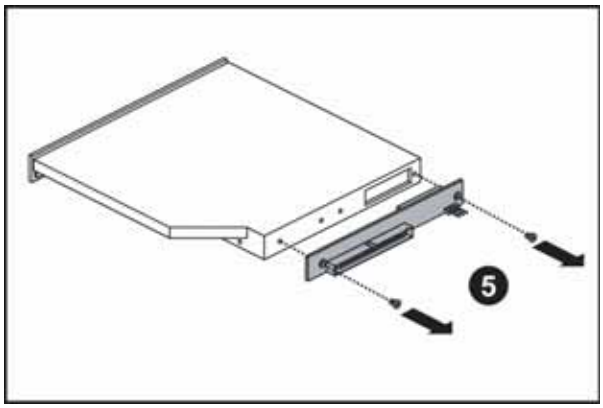
1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Unlock the bezel (if necessary) and remove it by pulling it from the chassis.
3. Follow the instructions in "Opening the server case" on page 25.
4. Disconnect the 44-pin optical drive cable from the optical drive interface board.
5. Loosen the thumbscrew (1), then move the retaining clip (2) away from the optical drive.



6 Move the optical drive to the right (3), then push the optical drive (4) out of the bay.



7 Unscrew the two screws (5) that secure the optical drive interface board to the optical drive, then remove the interface board.



8 Using the two screws you just removed, attach the optical drive interface board to the back of the new optical drive.

9 Insert the optical drive into the optical drive bay, aligning it with the clips on the right and left sides.

10 Secure the assembly by tightening the thumbscrew you previously loosened.

11 Attach the 44-pin optical drive cable to the back of the interface board.

12 Follow the instructions in "Closing the server case" on page 27.

13 Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

14 Reconnect all power cords and peripheral device cables, then turn on the server.

■

Removing and installing a hard drive

Important

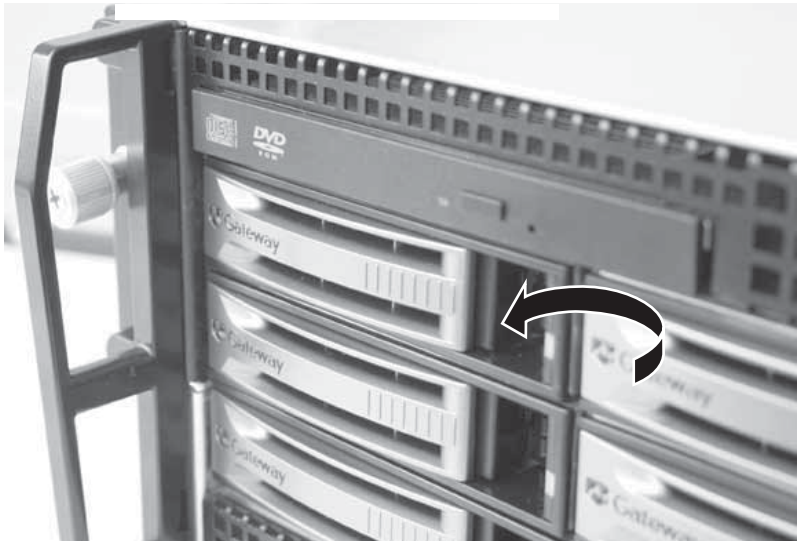
Gateway tests and verifies the operation and compatibility of the drives it sells. Especially in a hot-swap or mission-critical environment, additional or replacement drives must conform to Gateway standards.

Use this procedure to add or replace a hard drive in a hot-swap bay. Your server supports as many as twelve 1-inch high, 3.5-inch hot-swap SATA and SATA II hard drives or twelve 1-inch high, 3.5-inch hot-swap SAS hard drives. You can purchase additional drives through your Gateway Sales or Customer Care representative.

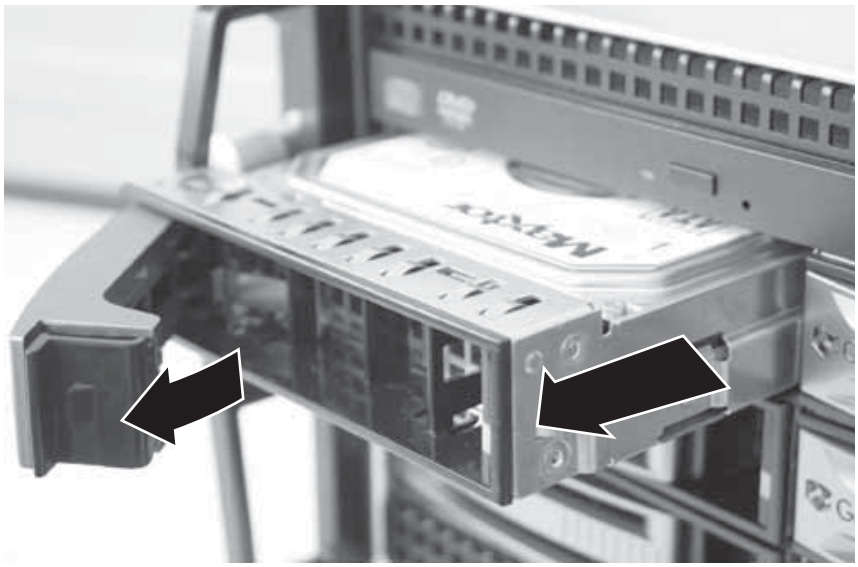
To remove and install a hot-swap hard drive:

Caution
Before you remove a failed drive, use the appropriate software and utilities installed on the server to stop all activity on the failed drive. Instructions for using the software are provided by the software manufacturer. Failure to do so may destroy the data on the drive.

1. Unlock the bezel (if necessary) and remove it by pulling it from the chassis.
2. Pull the drive release lever out. The drive release lever opens.



3. Pull the drive carrier straight out of the server.



4. If you are replacing a hard drive, remove the four screws that secure the old hard drive to the drive tray, then remove the drive from the tray. If you are installing a new drive, remove the dummy hard drive from the drive tray.
5. Using the four screws you removed, install the new hard drive into the drive tray.
6. Make sure that the tray's release lever is open, then slide the new drive fully into the empty hot-swap drive bay.
7. Push the lever back into place to secure the hard drive in the bay.
8. Reinstall the bezel, if required, by snapping it into place on the front of the chassis.

■

Filling empty drive bays

Empty drive bays in the server must be filled by empty drive trays. With the bezel removed, install the appropriate carrier, then replace the bezel by snapping it into place on the front of the server. Empty drive carriers for unused drive bays are included with your server.

Installing memory

Caution
Use only DDR2-667 MHz compliant, 184-pin, SDRAM registered ECC, DIMM memory modules.

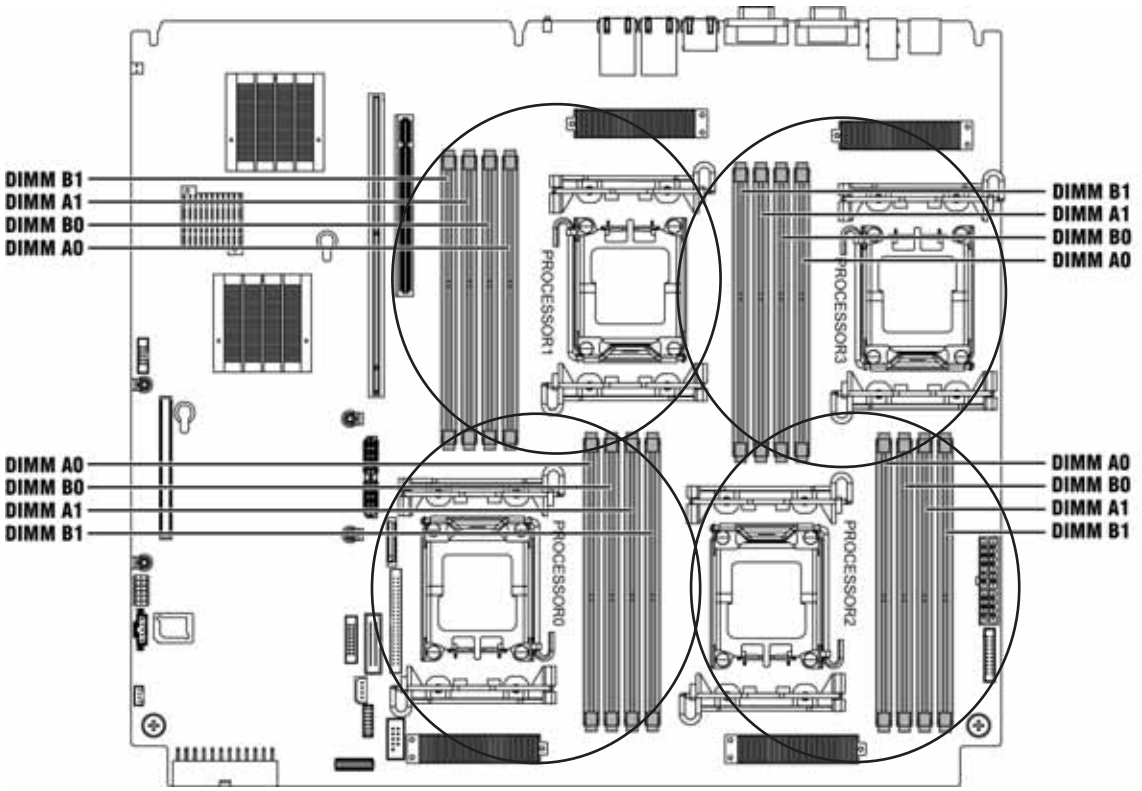
The system board supports 16 DDR2 667 MHz vertical DIMMs to provide up to 64 GB of memory with ECC support. The 667 MHz differential memory clocks are driven by the AMD processor with length matching and impedance controlled through all the DIMM slots. Supported DIMM sizes include 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB.

The BIOS configures the memory controller to run in single channel, dual channel, or four channel mode.

Caution
When using dual rank (double row) DIMMs, a maximum of four loads per memory channel is supported. This means a maximum of four dual rank DIMMs can be populated on this system board.

DIMM banks must be populated using the following guidelines:

There are four groups of DIMMs with four DIMMs in each group on the system board, to support processor 0, processor 1, processor 2, and processor 3. Each group supports one processor (circled). When you insert the DIMM(s), you must always start with DIMMA1 and DIMMB1 as a pair.



Caution
All DIMMs installed must be the same speed. Do not install more than four dual rank DIMMs or the BIOS will generate a memory configuration error.

If you install two processors, refer to the following table:

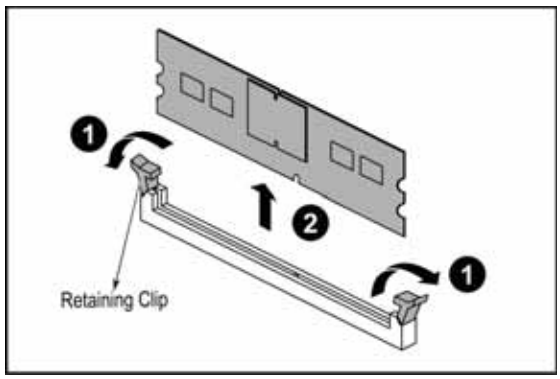
DIMM	Processor	DIMMA0	DIMMB0	DIMMA1	DIMMB1	Total Memory
4	Processor 0	-	-	512 MB	512 MB	2 GB
	Processor 1	-	-	512 MB	512 MB	
	Processor 0	-	-	1 GB	1 GB	4 GB
	Processor 1	-	-	1 GB	1 GB	
	Processor 0	-	-	2 GB	2 GB	8 GB
	Processor 1	-	-	2 GB	2 GB	
	Processor 0	-	-	4 GB	4 GB	16 GB
	Processor 1	-	-	4 GB	4 GB	
8	Processor 0	512 MB	512 MB	512 MB	512 MB	4 GB
	Processor 1	512 MB	512 MB	512 MB	512 MB	
	Processor 0	1 GB	1 GB	1 GB	1 GB	8 GB
	Processor 1	1 GB	1 GB	1 GB	1 GB	
	Processor 0	2 GB	2 GB	2 GB	2 GB	16 GB
	Processor 1	2 GB	2 GB	2 GB	2 GB	
	Processor 0	4 GB	4 GB	4 GB	4 GB	32 GB
	Processor 1	4 GB	4 GB	4 GB	4 GB	

If you install four processors, refer to the following table:

DIMM	Processor	DIMMA0	DIMMB0	DIMMA1	DIMMB1	Total Memory
8	Processor 0	-	-	512 MB	512 MB	4 GB
	Processor 1	-	-	512 MB	512 MB	
	Processor 2	-	-	512 MB	512 MB	
	Processor 3	-	-	512 MB	512 MB	
	Processor 0	-	-	1 GB	1 GB	8 GB
	Processor 1	-	-	1 GB	1 GB	
	Processor 2	-	-	1 GB	1 GB	
	Processor 3	-	-	1 GB	1 GB	
	Processor 0	-	-	2 GB	2 GB	16 GB
	Processor 1	-	-	2 GB	2 GB	
	Processor 2	-	-	2 GB	2 GB	
	Processor 3	-	-	2 GB	2 GB	
	Processor 0	-	-	4 GB	4 GB	32 GB
	Processor 1	-	-	4 GB	4 GB	
	Processor 2	-	-	4 GB	4 GB	
	Processor 3	-	-	4 GB	4 GB	
16	Processor 0	512 MB	512 MB	512 MB	512 MB	8 GB
	Processor 1	512 MB	512 MB	512 MB	512 MB	
	Processor 2	512 MB	512 MB	512 MB	512 MB	
	Processor 3	512 MB	512 MB	512 MB	512 MB	
	Processor 0	1 GB	1 GB	1 GB	1 GB	16 GB
	Processor 1	1 GB	1 GB	1 GB	1 GB	
	Processor 2	1 GB	1 GB	1 GB	1 GB	
	Processor 3	1 GB	1 GB	1 GB	1 GB	
	Processor 0	2 GB	2 GB	2 GB	2 GB	32 GB
	Processor 1	2 GB	2 GB	2 GB	2 GB	
	Processor 2	2 GB	2 GB	2 GB	2 GB	
	Processor 3	2 GB	2 GB	2 GB	2 GB	
	Processor 0	4 GB	4 GB	4 GB	4 GB	64 GB
	Processor 1	4 GB	4 GB	4 GB	4 GB	
	Processor 2	4 GB	4 GB	4 GB	4 GB	
	Processor 3	4 GB	4 GB	4 GB	4 GB	

To install or replace memory:

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.
3. Pull the plastic tabs (1) away from the sides of the memory module slot. If you are replacing a memory module, lift the old memory module (2) out of the slot.



4. Align the notch on the new module with the notch in the memory module slot and press the module firmly into the slot. The tabs on the sides of the memory slot should secure the memory module automatically.
5. Follow the instructions in "Closing the server case" on page 27.
6. Turn on the server and open the BIOS setup utility. Verify the **System Memory** listed in the **Main** menu. When you exit the BIOS setup utility, make sure that the operating system completely loads. If you receive an error, review the memory overview information in "Installing memory" on page 31.

■

Installing and removing PCI expansion cards

Caution
Always operate your server with the PCI riser assembly in place. The PCI riser assembly is important for correct airflow within the server. Operating the server without the PCI riser assembly in place could result in overheating and possible data loss or equipment damage.

The system board provides one 280-pin PCI-X 66MHz expansion slot and one PCI-E x8 expansion slot. One PCI-X 66 MHz expansion slot can support two PCI-E x8 expansion slots with x8 speed and one PCI-X 66 MHz using the riser card. One PCI-E expansion slot can support two PCI-E x8 expansion slots with x8 speed using the riser card. The riser card comes with the system package. The edge connectors of the riser card connect to the PCI slots on the system board.

Removing and installing the PCI riser assembly, a riser, or a PCI card

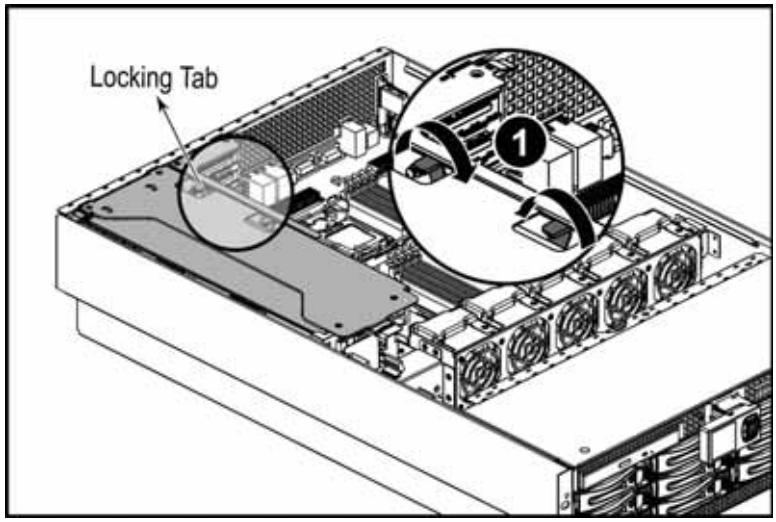
Caution
The PCI riser assembly and individual PCI expansion cards are not hot-swappable. Before installing or removing any part of the assembly, make sure that power is turned off and the power cord(s) is unplugged.

To remove and reinstall the PCI riser assembly:

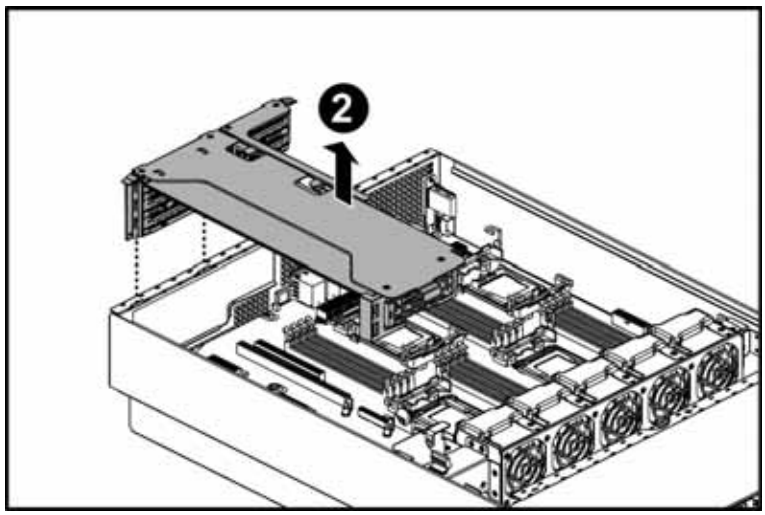
1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.

3 If you are replacing a card, disconnect any cables that are attached to the old card.

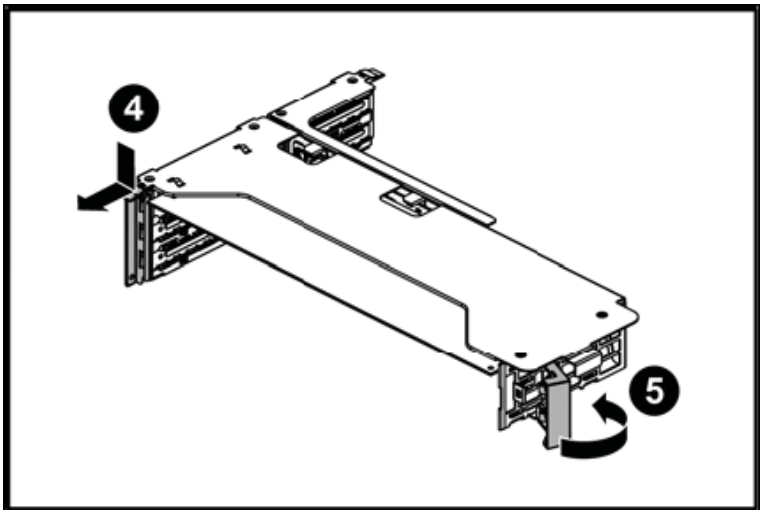
4 Push the riser card locking tabs (1) in the directions shown in the illustration.



5 Lift the riser card assembly out of the chassis (2) and place it on a clean, static-free surface.

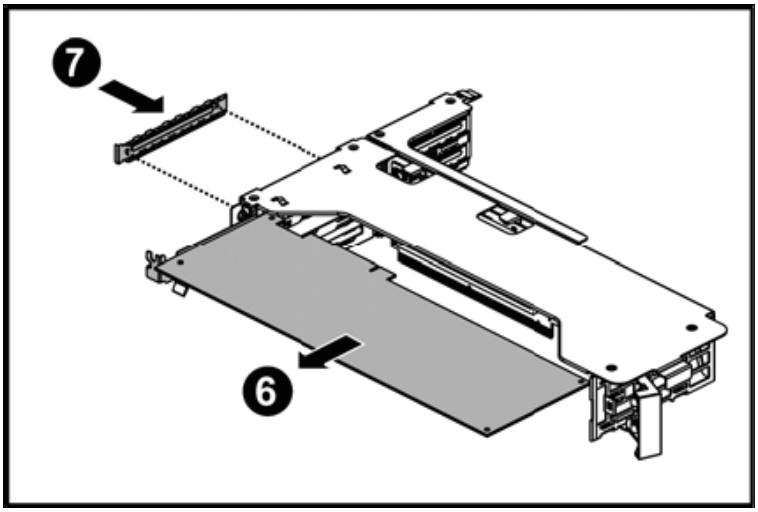


6 Press down and open the release lever (4) and flip open the card guide tab (5).



7 Remove the expansion card (6). If you are not replacing the card, install a slot cover (7) on the back of the riser card assembly.

Caution
Do not touch the contacts on the bottom part of the expansion card. Touching the contacts can cause electrostatic damage to the card.

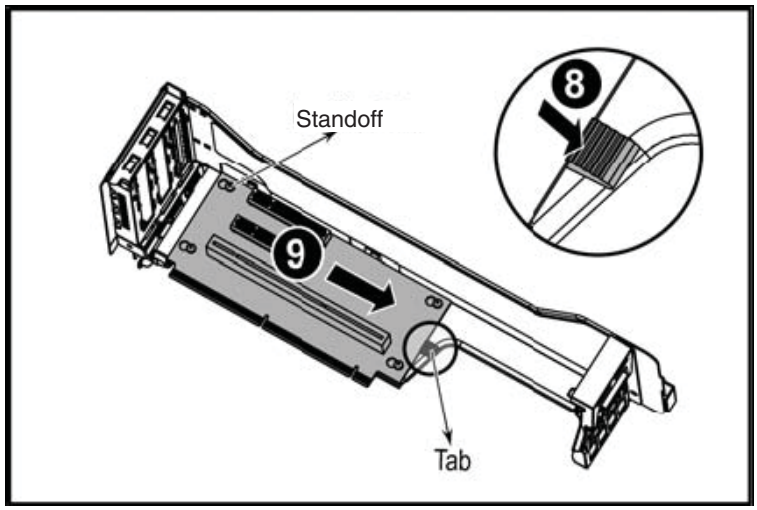


8 If you are replacing the riser card, continue with the next step.

- OR -

If you are replacing the PCI card, go to Step 11.

9 Press the tab (8) holding the riser card in the riser card assembly, then push the riser card in the direction shown (9) to unlock and remove it from the standoffs.

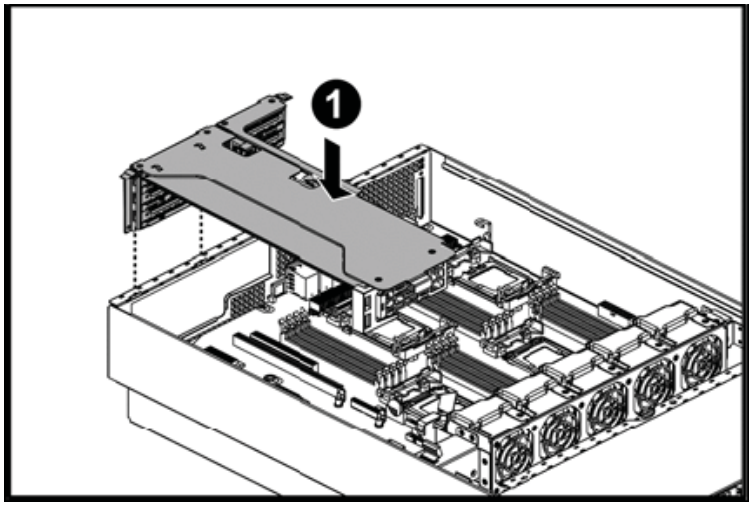


10 Insert the new riser card into the riser card assembly, then push it toward the back of the assembly. It should snap into place.

11 Insert the new PCI card into the riser card, making sure any connectors extend through the slot at the back of the assembly and that the card is fully seated in the riser card.

12 Close the release lever (see Step 6) and the card guide tab.

13 Position the PCI riser card assembly (1) over the PCI socket on the server board, then press the PCI riser card assembly into the PCI socket until it clicks into place.



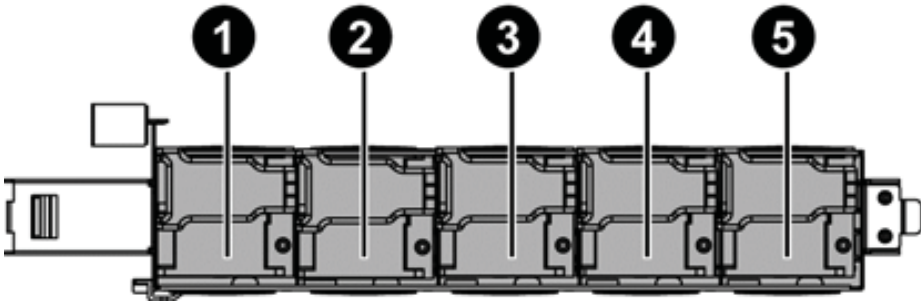
14 Follow the instructions in "Closing the server case" on page 27.

15 See the card's documentation for software installation instructions.

■

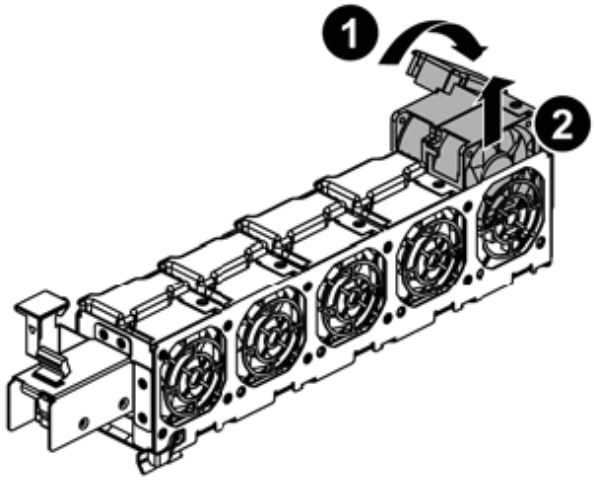
Replacing system fans

This server contains five system fan groups seated in the fan cage. The fan cage is located inside the chassis and can hold as many as five groups of hot-swappable fans. When replacing a fan, it is not necessary to power off the server. These fans maintain the ideal temperature for the system board, backplane and disk drives. If one fan group fails, the speed of the other fan groups will increase. With the bad one replaced, the other fan groups may revert to the normal speed.



To replace a system fan:

1. Follow the instructions in "Preventing static electricity discharge" on page 24.
2. Follow the instructions in "Opening the server case" on page 25.
3. Determine which fan group needs to be replaced by noting which fans are not operating.
4. Pull up the locking handle (1) on the system fan, then lift the fan group (2) from the fan cage in the chassis.



5. Insert the replacement fan group into the fan cage and press down the locking handle to secure the fan group in place.

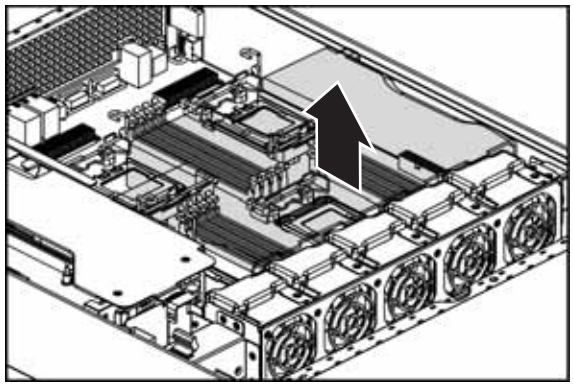
Important
Make sure that the arrows on top of the fans indicating airflow point to the back of the chassis. The fan cable should exit the fan module toward the back of the chassis.

6. Replace the fan duct by placing it in the chassis.
7. Follow the instructions in "Closing the server case" on page 27.

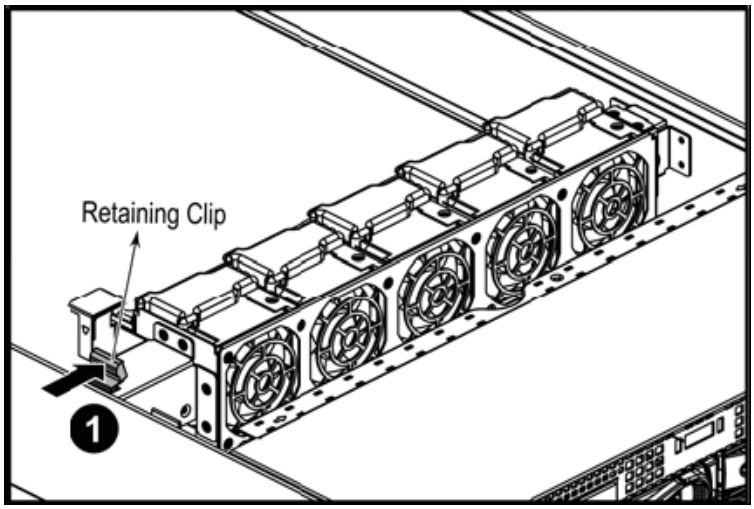
■

To replace the system fans and the fan cage:

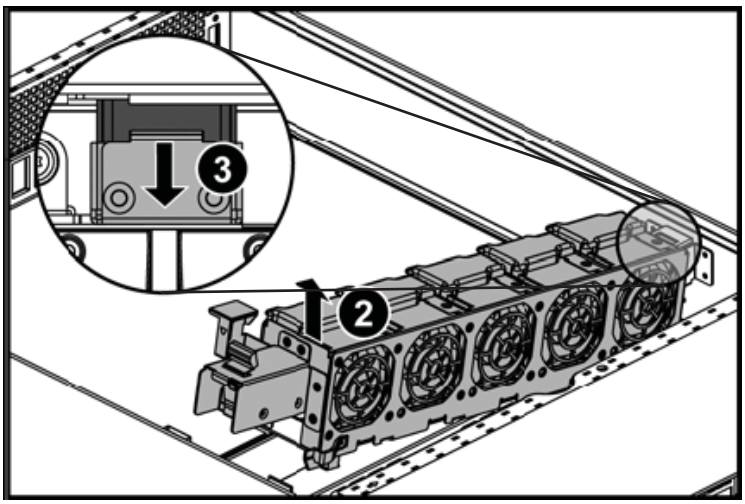
1. Follow the instructions in "Preventing static electricity discharge" on page 24.
2. Follow the instructions in "Opening the server case" on page 25, but do not turn off the server or unplug the power cord(s) or other cables.
3. Remove the fan duct by lifting it out of the chassis.



4. Lift the retaining clip (1).



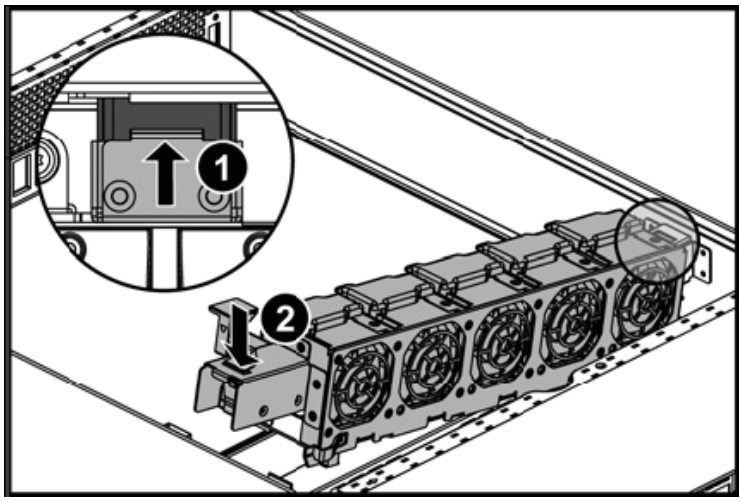
5 Lift one side of the fan cage (2) and disengage the retention tab (3), then disconnect the fan power and fan tach cables from the system board and remove the fan cage from the chassis.



6 Insert the fans into the new fan cage.

Important
Make sure that the arrows on top of the fans indicating airflow point to the back of the chassis.

7 Connect the fan power and fan tach cables to the system board, then insert the retention tab (1) into the corresponding clip on the chassis and push the other side of the fan cage down (2), making sure that the retaining clip is inserted into the hole in the chassis.



8 Replace the fan duct by placing it into the chassis.

9 Follow the instructions in "Closing the server case" on page 27.

■

Replacing or adding a processor

Warning
Processors and heat sinks may be hot if the computer has been running. Before replacing a processor or heat sink, let them cool for several minutes.

Caution
A heat sink must be installed on the processor. Installing a processor without a heat sink could damage the processor.

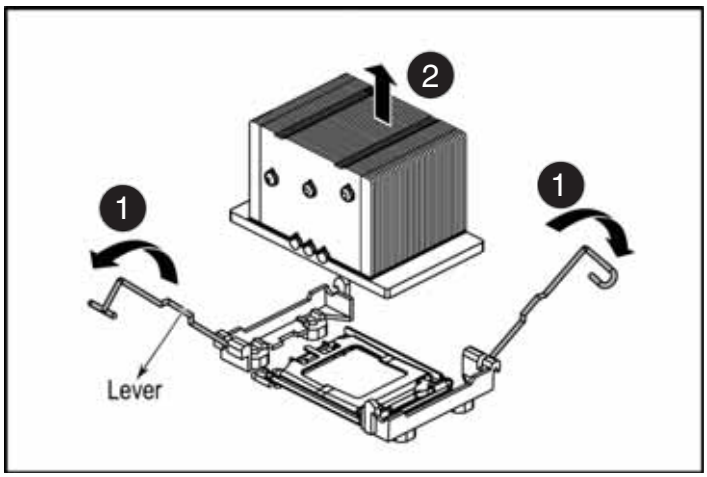
The system board supports as many as four AMD® Opteron™ 2000 series processors with 3.0 GHz Hyper Transport Bus. With four 1207-pin LGA socket F processor slots, the system can be configured with as many as four processors. The system connects with the nVIDIA MCP 55 through the Hyper Transport Bus. The server automatically detects the processors each time you turn it on. Whenever you install new processors, you should first install the most current version of the BIOS. For instructions, see "Updating the BIOS" on page 54.

Important
You must have a processor in the Processor 0 socket, or your server will not start. If you are upgrading your server from one processor to multiple processors, you may need to reconfigure your operating system so it can recognize the additional processors. For instructions, see your operating system's documentation.

Important
If you install multiple processors onto the system board, the processors must be the same speed, revision, core voltage, and bus speed.

To replace a processor:

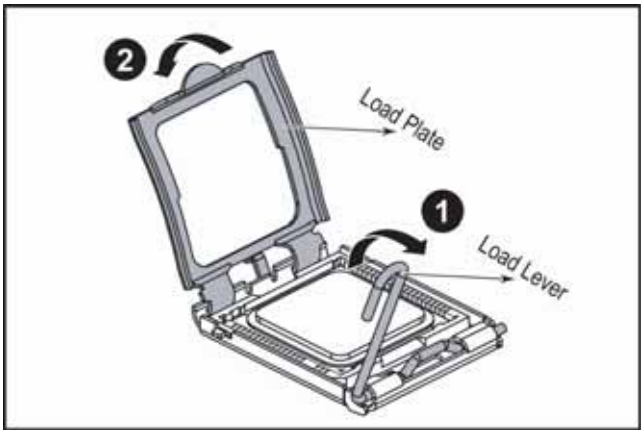
1. Install the most current BIOS version. For instructions, see "Updating the BIOS" on page 54.
2. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
3. Follow the instructions in "Opening the server case" on page 25.
4. Push down, then pull out and up on the heatsink retention levers (1) and move them out of the way.



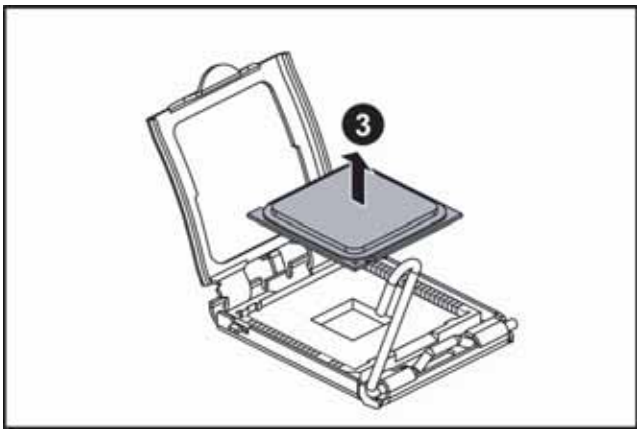
Caution
The heatsink has Thermal Interface Material (TIM) on the bottom. Be careful not to damage this material when you remove the heatsink from the processor. If removing the heatsink also pulls the processor out of the processor socket, the processor could be damaged.

5. Lift the heatsink straight up (2), then remove the heatsink from the processor.

6 Unlock the load lever (1) and lift it up, then open the load plate (2) to release the processor.

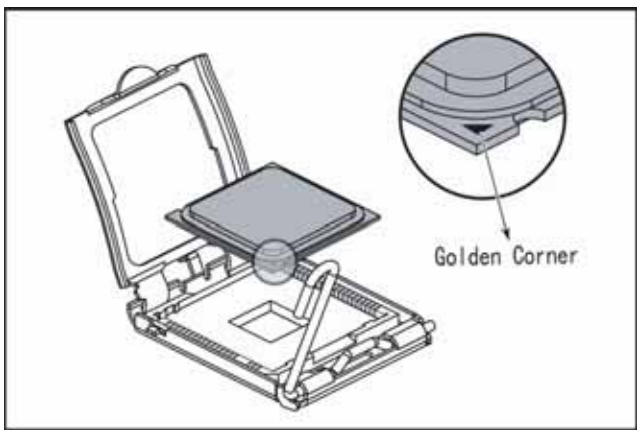


7 Lift the processor (3) out of the socket and place it in a static-free bag or case for storage.



8 Insert the new processor into the socket, making sure that the gold triangle on the corner is situated as shown in the following illustration.

Caution
The processor only fits the socket when oriented as indicated. Do not force the processor into the socket. You may bend or damage the processor. If the processor does not fit completely, check its orientation and check for bent pins.



9 When the processor is oriented correctly and in place, press it firmly into the socket, rotate the load plate into place, and push down the load lever until it clicks into place.

Caution
The heatsink has Thermal Interface Material (TIM) located on the bottom of it. Use caution when you unpack the heatsink so you do not damage the TIM. If you are reusing the original heatsink, make sure that the TIM on the bottom of the heatsink is not damaged. If the TIM is damaged, you should remove the old TIM, then apply new TIM to the bottom of the heatsink.

10 Place the heatsink onto the processor, then push down the heatsink retaining levers and lock them under the retaining hooks on the heatsink socket.

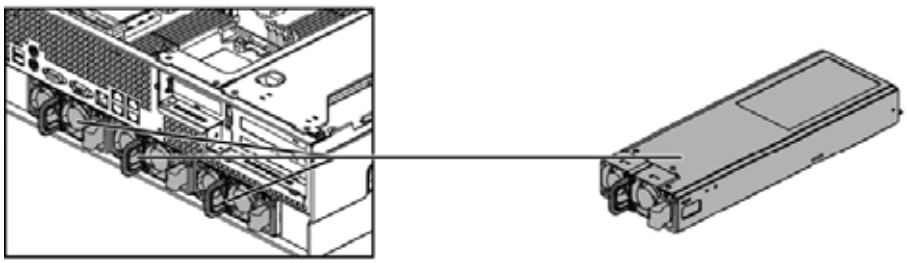
11 Follow the instructions in "Closing the server case" on page 27.

■

Replacing a power supply module

Caution
The power supplies in this server contain no user-serviceable parts. Only a qualified computer technician should service the power supplies.
Your server comes with 3-wire AC power cords fitted with the correct plug style for your region. If this plug does not match the connector on your surge protector, UPS, or wall outlet, do not attempt to modify the plug in any way. Use a surge protector, UPS, or wall outlet that is appropriate for the supplied AC power cords.

Your server uses as many as three 700 W hot-swappable power supply modules. If your server has more than one power supply module installed, the modules act as redundant, hot-swappable power supplies. If one of the power supply modules fails, the other power supply module(s) support the server while you replace the failed module. You do not need to turn off the server or disconnect peripheral devices to replace a failed redundant power supply module.



If your server is only equipped with a single power supply module, the server must be turned off and the AC power cord removed before replacing the module.

▶ **To replace a power supply module:**

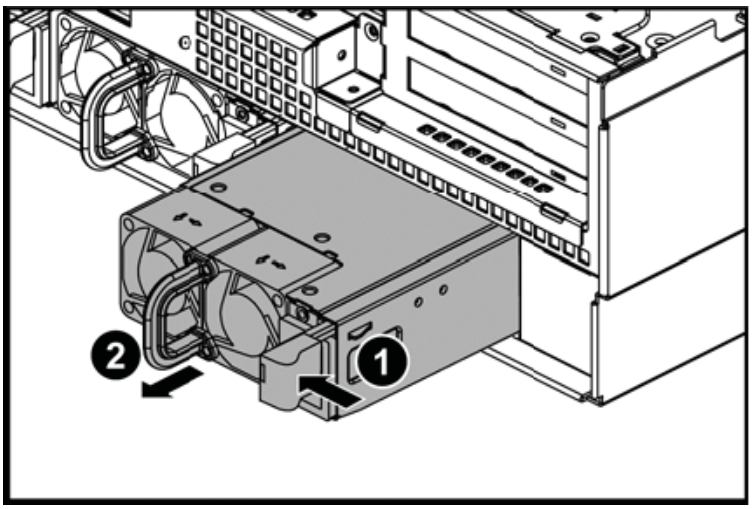
1 If your server is equipped with more than one power supply module, determine which power supply module has failed (the LED on the power supply will be orange).

2 If your server has only one power supply module installed, make sure that you turn off the server, then unplug the power cord before continuing.

- OR -

If your server has two or more power supply modules installed, you do not need to turn off the power to the server before continuing.

3 Press the retaining clip (1) on the power supply to the left to release the power supply module (2) from the chassis.



4 Using the handle, pull the power supply module straight out of the server. It may take considerable force to remove.

5 Push the new power supply module into the server, with the retaining clip on the right, until it locks into place.

6 Reconnect the AC power cord for the new power supply module.

■

Replacing the power distribution module

To replace the RPS power distribution module:

1 Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

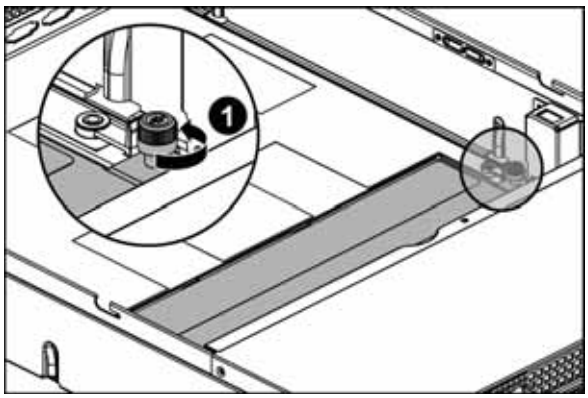
2 Follow the instructions in "Opening the server case" on page 25.

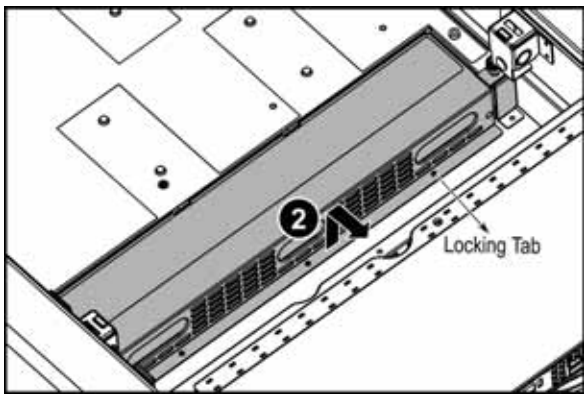
3 Remove the PCI riser assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.

4 Remove the fan duct and system fan cage by following the instructions in "Replacing system fans" on page 38.

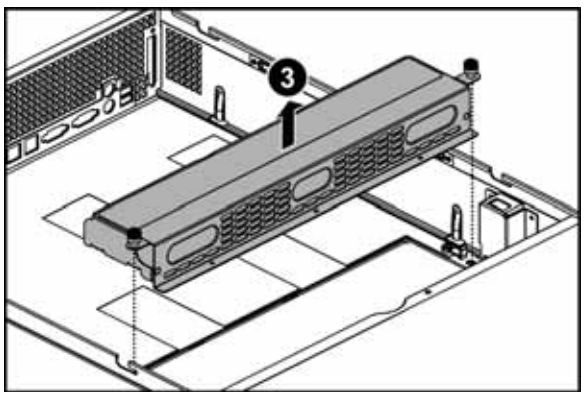
5 Disconnect the main power, CPU power, backplane power, I^2C power, and midplane power cables from the system board. See "System board" on page 5 for the location of the connectors on the system board.

6 Loosen the thumbscrew (1), then lift the distribution module slightly and move it toward the front of the case (2) to release it from the three locking tabs.





7 Lift the power distribution board (3) out of the chassis.



8 Insert the new power distribution board into the chassis, then move it toward the back of the chassis to engage the three locking tabs.

9 Tighten the thumbscrew to secure the power distribution board in the chassis.

10 Reconnect the power cables. See "System board" on page 5 for the location of the connectors on the system board.

11 Replace the system fan cage and fan duct by following the instructions in "Replacing system fans" on page 38.

12 Reinstall the PCI riser assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.

13 Follow the instructions in "Closing the server case" on page 27.

■

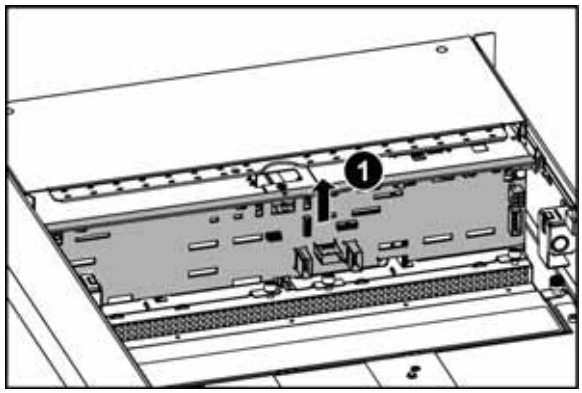
Replacing the hot-swap backplane

Caution
The hot-swap backplane is not hot-swappable. Before removing or replacing the backplane, you must first turn off the server and all peripheral devices attached to the server, and remove the AC power cord(s) from the power supply or wall outlet.

To replace the hot-swap backplane:

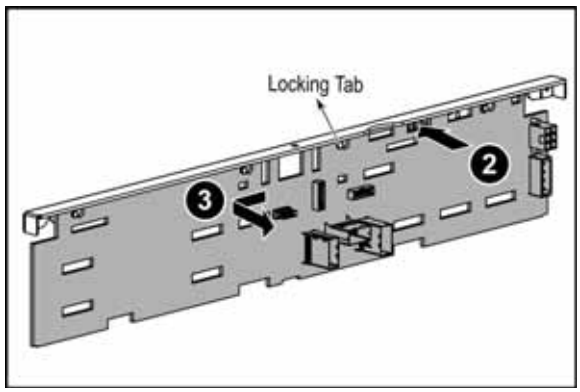
1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Unlock the bezel (if necessary) and remove it by pulling it straight off the front of the server.
3. Follow the instructions in "Opening the server case" on page 25.
4. Remove all of the hot-swap drive carriers from the server and make note of which bay you remove each drive from. For instructions, see "Removing and installing a hard drive" on page 29.
5. Remove the fan duce, and the system fans and fan cage following the instructions in "Replacing system fans" on page 38.
6. Disconnect all cables from the backplane.
7. Pull the backplane bracket and backplane (1) out of the chassis.

Caution
Pressing or pulling on any components on the backplane could result in damage to the backplane.



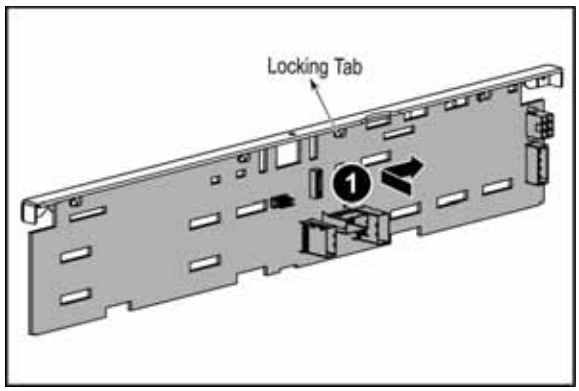
Caution
Make sure you do not pinch, bind, or damage any cables as you install the backplane.

8. Press the release tab (2) on the backplane bracket and push the backplane to the left (3).

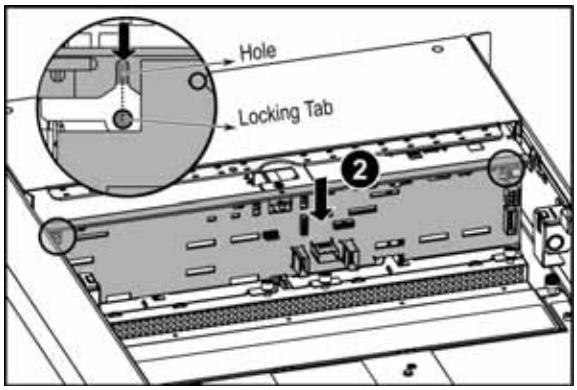


9. Pull the backplane from the backplane bracket.

10 Holding the new backplane by the edges only, align it with the locking tabs on the backplane bracket, then place it on the locking tabs (1) and slide it to the right until it click into place.



11 Insert the backplane assembly into the chassis (2), then press down on the assembly until the locking tabs on the chassis engage the holes on the right and left sides of the bracket.



12 Reconnect all cables to the backplane.

13 Replace the system fans and fan cage, and the fan duct by following the instructions in "Replacing system fans" on page 38.

14 Follow the instructions in "Closing the server case" on page 27.

15 Reinstall the hot-swap drives back into the server. Make sure that you install the drives into the same bays you removed them from in Step 4. For instructions see "Removing and installing a hard drive" on page 29.

16 Replace the bezel by snapping it into place on the front of the server.

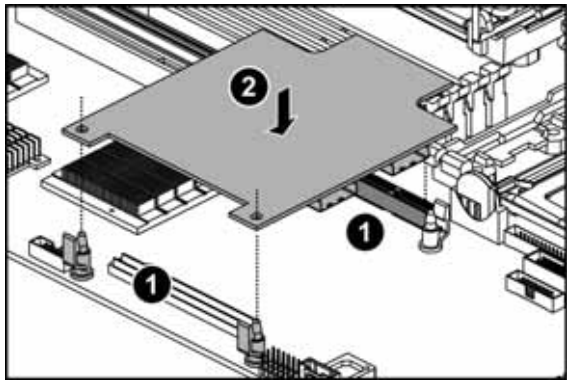
■

Installing and removing an optional mezzanine board

This server has two types of optional mezzanine boards. They include a 2-channel SAS mezzanine board, and 2-channel SAS mezzanine board with RAID. They are designed to provide extra HDD storage capability with one 160-pin mezzanine board connector. Each type of mezzanine board uses the specific chipset for optimal features and provides expansive storage by connecting with the extra drives.

To install an optional mezzanine board:

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.
3. Remove the PCI riser assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.
4. Align the holes on one side of the mezzanine board with the plastic standoffs and align the other side with the mezzanine board slots (1).

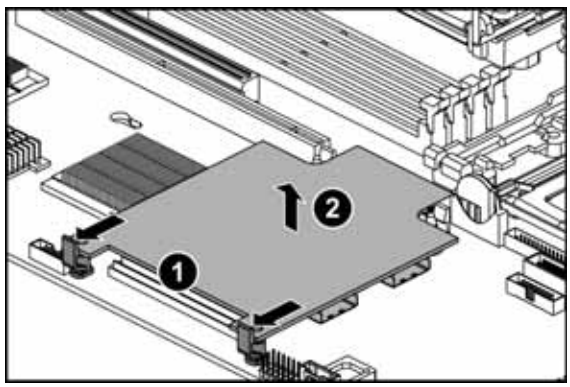


5. Push down on the card (2) to seat it in the mezzanine board slot and onto the plastic standoffs until the retaining tabs snap into place.
6. Replace the PCI riser card assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.
7. Follow the instructions in "Closing the server case" on page 27.

■

To remove an optional mezzanine board:

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.
3. Remove the PCI riser assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.
4. Push aside the plastic retaining tabs (1) and pull the mezzanine board (2) out of the mezzanine board slot.



5. Replace the PCI riser card assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.
6. Follow the instructions in "Closing the server case" on page 27.

■

Replacing the CMOS battery

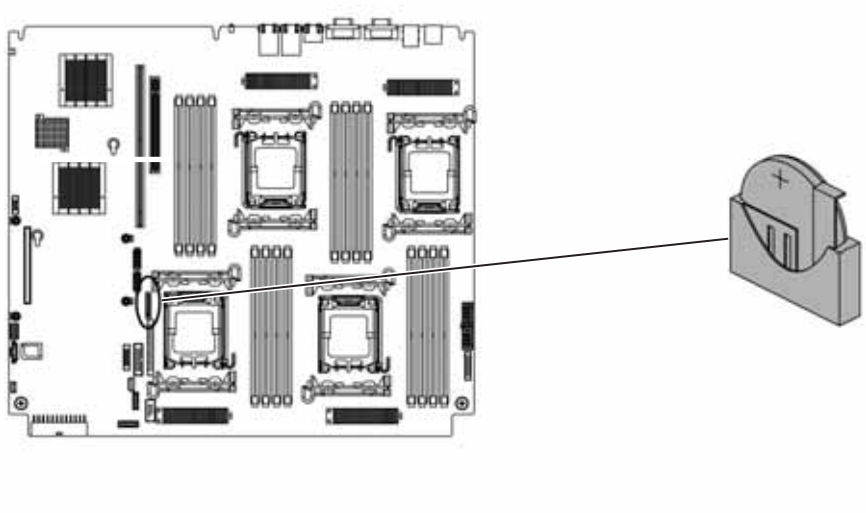
Warning

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of or recycle used batteries by taking them to a hazardous waste facility. Follow all local regulations for correct battery disposal.

If the server clock does not keep time or the settings in the BIOS Setup utility are not saved when you turn off the server, replace the CMOS battery with an equivalent battery.

▶ **To replace the battery:**

1. Print the appendix for "BIOS Settings" on page 87 in this guide.
2. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Record the BIOS settings on your printout, then close the utility.
4. Turn off your server, then follow the instructions in "Preventing static electricity discharge" on page 24.
5. Follow the instructions in "Opening the server case" on page 25.
6. Locate the old battery on the system board and note its orientation. You will need to install the new battery the same way.



7. Push the battery retention clip away from the battery until the battery lifts up, then remove the old battery. You can use a screwdriver to help lift the battery.
8. Make sure that the positive (+) side of the new battery is facing the correct direction, then press the new battery into the socket until it snaps into place.
9. Follow the instructions in "Closing the server case" on page 27.
10. Turn on your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
11. Restore any BIOS settings that you wrote down in Step 3.
12. Save all your settings and close the BIOS Setup utility.

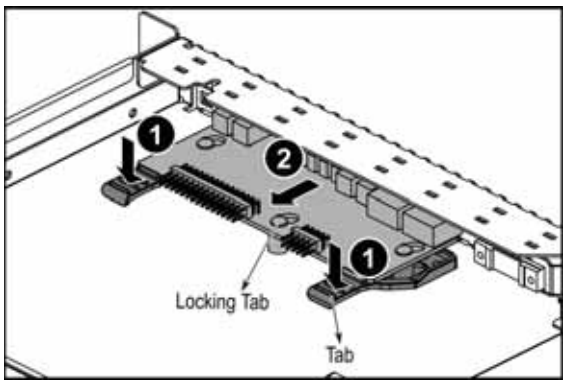
■

Replacing the control panel

Caution
Your server must be operated with a control panel in place.

To replace the control panel adapter card:

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.
3. Disconnect all cables from the control panel.
4. Press down the two side locking tabs, then pull the control panel back and lift it out of the chassis



5. Holding the new control panel by the edges, align it with the locking tabs in the chassis, then slide it toward the front of the chassis.
6. Reconnect the cables to the control panel.
7. Follow the instructions in "Closing the server case" on page 27.

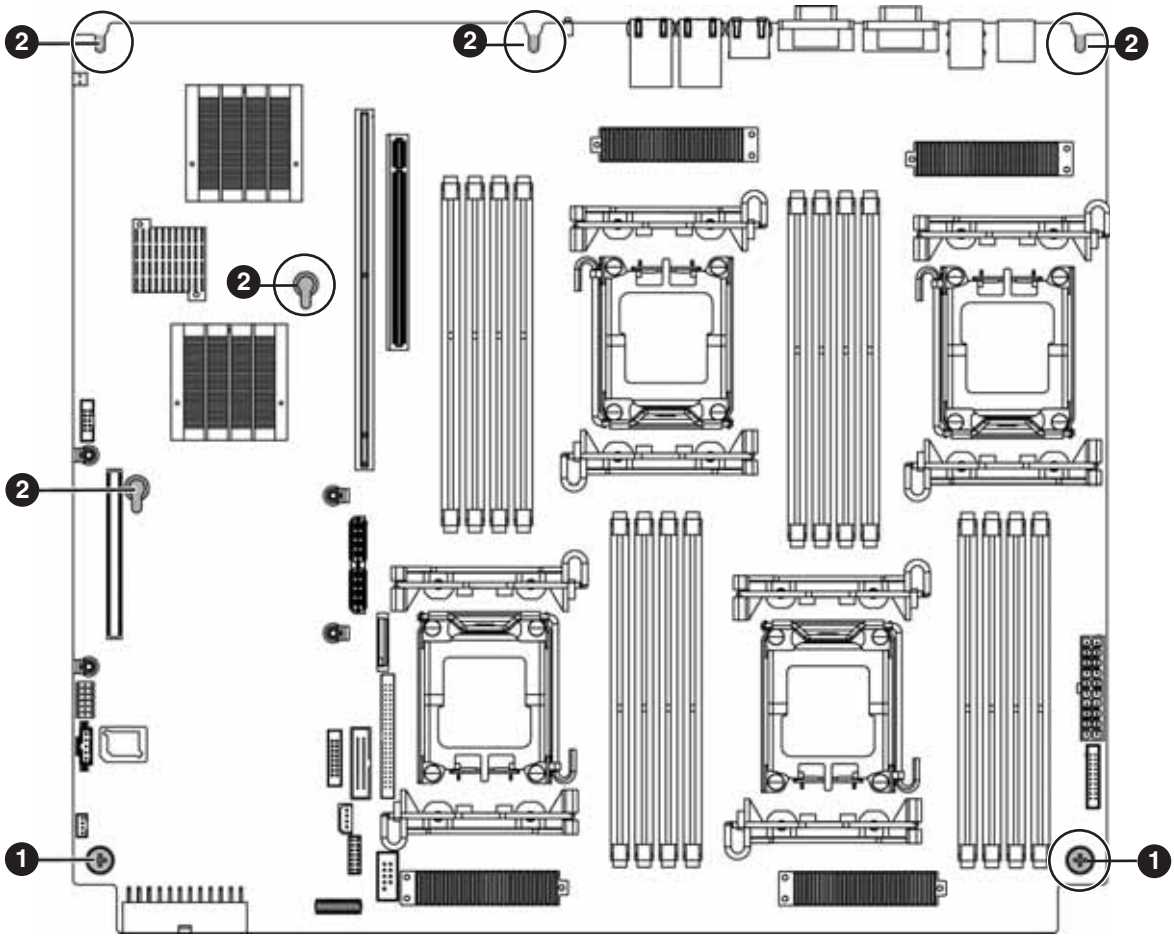
■

Replacing the system board

To replace the system board:

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.
3. Remove the PCI riser assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.
4. Remove the fan duct and system fan cage by following the instructions in "Replacing system fans" on page 38.
5. Remove the memory modules by following the instructions in "Installing memory" on page 31.
6. Remove the heatsinks and processors by following the instructions in "Replacing or adding a processor" on page 41.
7. Disconnect all cables from the system board, noting their locations and orientation. (You will reconnect the cables after you install the new board.)

8 Loosen the two thumbscrews (1) that secure the system board to the server.



9 Slide the system board toward the back of the server until it is free of the five retaining standoffs (2), then lift the board from the chassis.

10 Place the old system board in a static-free bag for storage.

11 Insert the new system board into the chassis, aligned with the eight retaining standoffs, then slide the board toward the front of the case so the board is held by the standoffs.

12 Tighten the two system board thumbscrews you loosened in Step 8.

13 Connect the cables you removed in Step 7

14 Replace the heatsink(s) and processor(s) Follow the instructions in "Replacing or adding a processor" on page 41.

15 Replace the memory by following the instructions in "Installing memory" on page 31.

16 Replace the system fan cage and fan duct by following the instructions in "Replacing system fans" on page 38.

17 Reinstall the PCI riser assembly by following the instructions in "Installing and removing PCI expansion cards" on page 34.

18 Follow the instructions in "Closing the server case" on page 27.

19 Turn on your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

20 Check BIOS settings to make sure that they detect the server's new hardware, then save your changes (if any) and close the BIOS Setup utility.

21 If your server does not start after installing the new system board, contact Gateway Customer Care. For more information, see "Getting Help" on page 9.

■

CHAPTER 5
Using the BIOS Setup Utility

- Opening the BIOS Setup utility
- Updating the BIOS
- Recovering the BIOS
- Resetting the BIOS
- Updating and recovering the BMC

Opening the BIOS Setup utility

The BIOS Setup utility stores basic settings for your server. These settings include basic hardware configuration, resource settings, and password security. These settings are stored and saved even when the power is off.

Caution

The options in the BIOS Setup utility have been set at the factory for optimal performance. Changes to these settings will affect the performance of your server. Before changing any settings, write them down in case you need to restore them later. You can record the settings on a printout of this guide's appendix for "BIOS Settings" on page 87.

To open the BIOS Setup utility:

1. Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

   When you select menu items, the Item Specific Help box on the right side of the screen displays specific information about the selection. The command bar across the bottom of the screen shows the keys you press to access help, navigate through the menus, and perform other tasks.

2. Select one of these menus:

   - **Main** gives you access to basic information and settings related to your server's hardware and configuration.
   - **Advanced** gives you access to information and settings for PCI, peripheral devices, memory, and the chipset.
   - **Boot** gives you access to information and settings for startup features and startup sequences.
   - **Security** gives you access to settings related to system access passwords. For more information, see "Server security" on page 18.
   - **Server** gives you access to settings for system management, console redirection, event log configuration, and fault-resilient boot settings.
   - **Exit** gives you access to options for closing the BIOS Setup utility.

   ■

Updating the BIOS

To update the BIOS:

1. Print the appendix for "BIOS Settings" on page 87.
2. Restart your server, then press F2 when the Gateway logo screen appears during startup.
3. Record any custom BIOS settings on your printout.
4. Download the BIOS update files from support.gateway.com.
5. Follow the instructions on the Web site or the readme.txt file in the downloaded zip file to update the BIOS.
6. After you have updated the BIOS, restart your server and load the default BIOS values.
7. Enter any custom BIOS settings you recorded in Step 3, then save your changes and close the BIOS Setup utility.

   ■

Recovering the BIOS

If you encounter a problem while you are updating the BIOS, such as a power outage, the BIOS update may not be successful. If the system continues to try to boot from the new, corrupted BIOS, you can manually recover the old BIOS so you can try another update.

Important
This method does not work if the keyboard is connected through the KVM switch.

To recover the old BIOS:

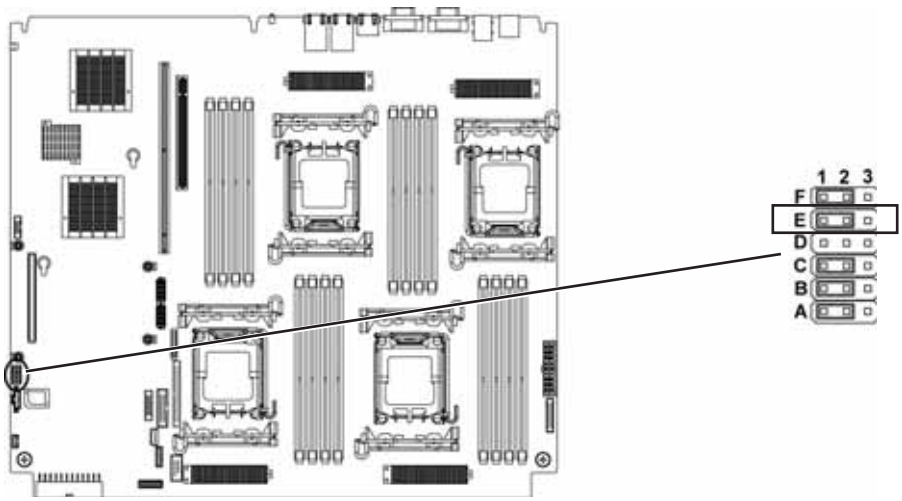
1. Insert a diskette (if a diskette drive is available), CD or DVD, or a bootable USB "disk-on-key" containing the AMIBOOT.ROM file.
2. Turn on or restart the server. Press and hold **CTRL+HOME** during power up until the recovery process begins (the server beeps). The process is complete when you see a message on the screen.
3. Remove the diskette, the CD or DVD, or the bootable USB "disk-on-key."
4. Restart the server. The old BIOS is recovered.

■

To manually recover the BIOS:

1. Turn off the server, then disconnect the power cords and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.
3. Remove the jumper across pins 1-2 of header J56-E, then place the jumper across pins 2-3.

Caution
Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.



4. Follow the instructions in "Closing the server case" on page 27.
5. Insert a bootable USB "disk-on-key" containing a valid BIOS image into a USB port.
6. Reconnect the power cords and turn on the server. The BIOS recovery is initiated.
7. Wait until the BIOS recovery is completed. The process may take up to 5 minutes.
8. Remove the bootable USB "disk-on-key."
9. Turn off the server, then disconnect the power cords and all other cables connected to the server.
10. Follow the instructions in "Opening the server case" on page 25.
11. Place the jumper back onto pins 1-2.

12 Follow the instructions in "Closing the server case" on page 27.

13 Plug in the AC power cords and turn on the server, then verify that the recovery was successful.

■

Resetting the BIOS

You can use two methods to clear all BIOS Setup settings and return them to the factory defaults:

- Press the power and reset buttons on the front of the server.
- Move the Clear CMOS jumper on the system board.

To reset the BIOS using the power and reset buttons:

1 Print the appendix for "BIOS Settings" on page 87 in this guide.

2 Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

3 Record any custom BIOS settings on your printout.

4 Press the reset button and hold it down for four seconds or more, then continuing to hold down the reset button, press the power button.

5 Release both buttons at the same time. The BIOS is reset.

■

To reset the BIOS using the system board jumper:

1 Print the appendix for "BIOS Settings" on page 87 in this guide.

2 Restart your server, then press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.

3 Record any custom BIOS settings on your printout.

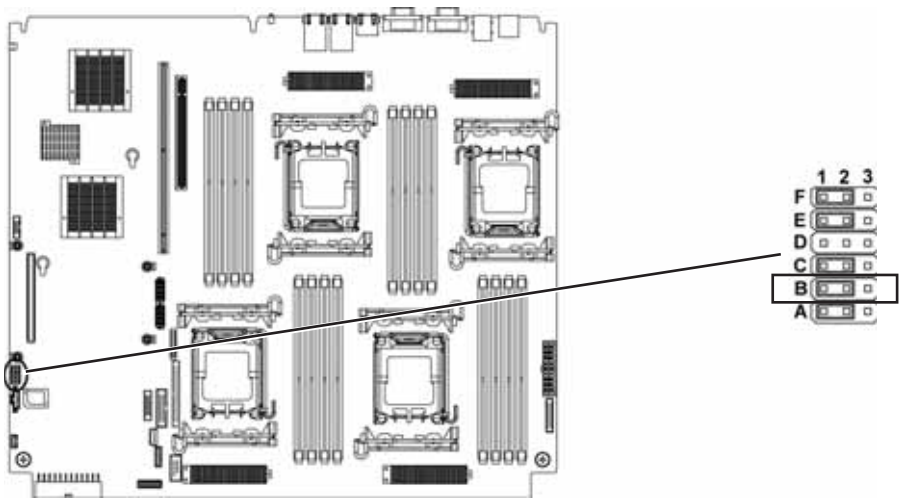
4 Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

5 Follow the instructions in "Opening the server case" on page 25.

6 Remove the jumper across pins 1-2 of header J56-B, then place the jumper across pins 2-3.

Caution

Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.



7 Follow the instructions in "Closing the server case" on page 27.

8 Reconnect the power cords and turn on the server. The BIOS is reset.

9 Turn off the server, then disconnect the power cords and all other cables connected to the server.

10 Follow the instructions in "Opening the server case" on page 25.

11 Place the jumper back onto pins 1-2.

12 Follow the instructions in "Closing the server case" on page 27.

■

Resetting BIOS passwords

To reset BIOS passwords, you must either reset and clear all BIOS settings, or use the Clear Password jumper. To reset all BIOS settings, follow the instructions in "Resetting the BIOS" on page 56.

Caution

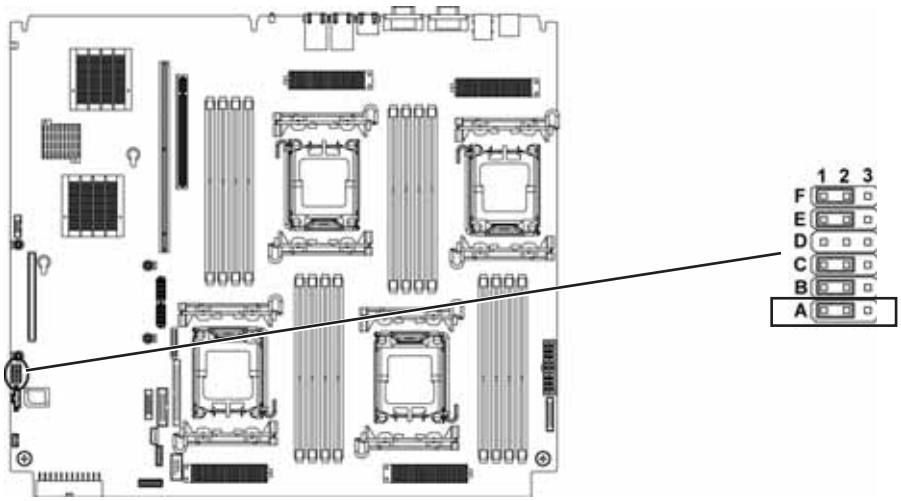
Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

▶ **To clear the BIOS password(s):**

1 Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.

2 Follow the instructions in "Opening the server case" on page 25.

3 Remove the jumper across pins 1-2 of header J56-A, then place the jumper across pins 2-3.



4 Follow the instructions in "Closing the server case" on page 27.

5 Reconnect the power cords and turn on the server. The BIOS password(s) is cleared.

6 Turn off the server, then disconnect the power cords and all other cables connected to the server.

7 Follow the instructions in "Opening the server case" on page 25.

8 Place the jumper back onto pins 1-2.

9 Follow the instructions in "Closing the server case" on page 27.

■

Updating and recovering the BMC

Updating the BMC firmware

To update the BMC firmware:

1. Download the BMC firmware zip file from support.gateway.com.
2. Read the release notes for the firmware update.
3. Follow the instructions on the Web site or in the readme.txt file in the downloaded zip file to update the firmware.
4. When the BMC update is complete, reboot your server.

■

Recovering the BMC

If you encounter a problem while you are updating the BMC, such as a power outage, the BMC update may not be successful. If this occurs, you may need to recover the old BMC.

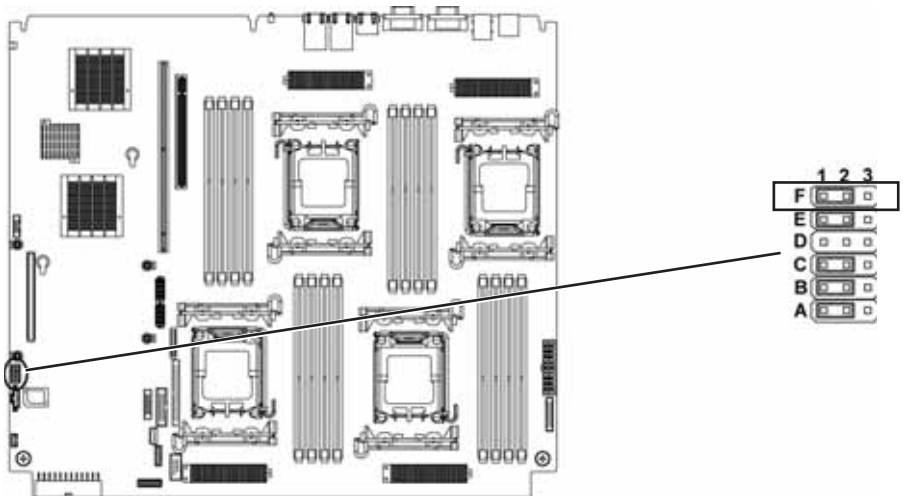
Important
This method does not work if the keyboard is connected through the KVM switch.

To manually recover the BMC:

1. Follow the instructions in "Preventing static electricity discharge" on page 24. Make sure that you turn off the server, then unplug the power cord(s) and all other cables connected to the server.
2. Follow the instructions in "Opening the server case" on page 25.

   Caution
   Moving the jumper while the power is on can damage your server. Always turn off the server and unplug the power cords and all other cables before changing the jumper.

3. Remove the jumper across pins 1-2 of header J3-F, then place the jumper across pins 2-3.



4. Follow the instructions in "Closing the server case" on page 27.
5. Update the BMC firmware by following Steps 1 through 4 in "To update the BMC firmware:" on page 58.
6. Follow the instructions in "Opening the server case" on page 25.
7. Remove the jumper from pins 2-3 and replace the jumper back onto pins 1-2.

8 Follow the instructions in "Closing the server case" on page 27.

9 Plug in the AC power cords and turn on the server for normal use.

■

CHAPTER 6
Troubleshooting

- Telephone support
- Tutoring and training
- Safety guidelines
- Error messages
- Troubleshooting

Telephone support

Before calling Gateway Customer Care

If you have a technical problem with your server, follow these recommendations before contacting Gateway Customer Care:

- Make sure that your server is connected correctly to a grounded AC outlet that is supplying power.
- If a peripheral device, such as a keyboard or mouse, does not appear to work, make sure that all cables are plugged in securely and plugged into the correct port or jack.
- If you have recently installed hardware or software, make sure that you have installed it following the instructions provided with it. If you did not purchase the hardware or software from Gateway, see the manufacturer's documentation and technical support resources.
- If you have "how to" questions about using a program, see:
  - The program's online Help
  - The program's documentation
  - Your operating system's documentation
  - The software or hardware manufacturer's Web site
- See "Troubleshooting" on page 67.
- Have your client ID, serial number (usually located on the back of your server case), and order number available, along with a detailed description of your issue, including the exact text of any error messages, and the steps you have taken.
- Make sure that your server is nearby at the time of your call. The technician may have you follow appropriate troubleshooting steps.
- Consider using Gateway's online technical support. Gateway's Web site has FAQs, tips, and other technical help. You can also use the Web site to e-mail Customer Care. For more information, visit Gateway's Customer Care Web site at support.gateway.com.

Telephone support

Gateway offers a wide range of customer service, technical support, and information services.

Telephone numbers

You can access the following services through your telephone to get answers to your questions:

Resource	Service description	How to reach
Gateway's fee-based software tutorial service	Get tutorial assistance for software issues.	800-229-1103 (charged to your credit card)
Gateway Customer Care	Talk to a Gateway Customer Care representative about a non-tutorial technical support question.	877-485-1464 (US) (say the word "Server") 800-846-3609 (Canada and Puerto Rico) 605-232-2191 (all other countries)
Sales, accounting, and warranty	Get information about available systems, pricing, orders, billing statements, warranty service, or other non-technical issues.	800-846-2000 (US) 888-888-2037 (Canada)

Tutoring and training

Gateway's Customer Care professionals cannot provide hardware and software training. Instead, Gateway recommends the following training resources.

Resource	Service description	For more information
Gateway Learning Libraries	A variety of courses and tutorials are available on CD. Select from several easy-to-use learning libraries.	www.gateway.com/training

Safety guidelines

While troubleshooting your server, follow these safety guidelines:

- Never remove the top panel while your server is turned on and while the modem cable and the power cords are connected.
- Do not attempt to open the monitor. To do so is extremely dangerous. Even if the power is disconnected, energy stored in the monitor components can be dangerous. Also, opening the monitor voids its warranty.
- Make sure that you are grounded correctly before opening the server. For more information about preventing damage from static electricity, see "Preventing static electricity discharge" on page 24.
- After you complete any maintenance task where you have to open the server case, make sure that you close the case and reconnect all cables before you restart your server.

Warning

To avoid bodily injury, do not attempt to troubleshoot your server problem if:
- The power cords or plugs are damaged
- Liquid has been spilled into your server
- Your server was dropped
- The case was damaged

Instead, unplug your server and contact a qualified computer technician.

Error messages

These messages often indicate procedural errors such as typing an incorrect keystroke or trying to save a file to a write-protected diskette. Some messages, however, may indicate a problem that requires further troubleshooting.

Memory messages

Gate20 Error

The BIOS is unable to correctly control the system board's Gate A20 function, which controls access of memory over 1 MB. This may indicate a problem with the system board.

Boot messages

Boot Failure ...

This is a generic message indicating the BIOS could not boot from a particular device. This message is usually followed by other information concerning the device.

Invalid Boot Diskette (if a diskette drive is available)

A diskette was found in the drive, but it is not configured as a bootable diskette.

Drive Not Ready

The BIOS was unable to access the drive because it indicated it was not ready for data transfer. This is often reported by drives when no media is present.

A: Drive Error

The BIOS attempted to configure the A: drive during POST, but was unable to correctly configure the device. This may be due to a bad cable or faulty diskette drive.

Insert BOOT diskette in A:

The BIOS attempted to boot from the A: drive, but could not find a correct boot diskette.

Reboot and Select proper Boot device or Insert Boot Media in selected Boot device

BIOS could not find a bootable device in the system or removable media drive does not contain media.

NO ROM BASIC

This message occurs on some systems when no bootable device can be detected.

Storage Device messages

Primary Master Hard Disk Error

The IDE/ATAPI device configured as Primary Master could not be correctly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure IDE/ATAPI devices in POST.

Primary Slave Hard Disk Error

The ATAPI device configured as Primary Slave could not be correctly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

Secondary Master Hard Disk Error

The ATAPI device configured as Secondary Master could not be correctly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

Secondary Slave Hard Disk Error

The ATAPI device configured as Secondary Slave could not be correctly initialized by the BIOS. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

Primary Master Drive - ATAPI Incompatible

The IATAPI device configured as Primary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

Primary Slave Drive - ATAPI Incompatible

The ATAPI device configured as Primary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

Secondary Master Drive - ATAPI Incompatible

The ATAPI device configured as Secondary Master failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

Secondary Slave Drive - ATAPI Incompatible

The ATAPI device configured as Secondary Slave failed an ATAPI compatibility test. This message is typically displayed when the BIOS is trying to detect and configure ATAPI devices in POST.

S.M.A.R.T. Capable but Command Failed

The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed.

This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.

S.M.A.R.T. Command Failed

The BIOS tried to send a S.M.A.R.T. message to a hard disk, but the command transaction failed.

This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.

S.M.A.R.T. Status BAD, Backup and Replace

A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure.

This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.

S.M.A.R.T. Capable and Status BAD

A S.M.A.R.T. capable hard disk sends this message when it detects an imminent failure.

This message can be reported by an ATAPI device using the S.M.A.R.T. error reporting standard. S.M.A.R.T. failure messages may indicate the need to replace the hard disk.

System configuration messages

DMA-2 Error

Error initializing secondary DMA controller. This is a fatal error, often indication a problem with system hardware.

DMA Controller Error

POST error while trying to initialize the DMA controller. This is a fatal error, often indication a problem with system hardware.

Checking NVRAM..Update Failed

BIOS could not write to the NVRAM block. This message appears when the FLASH part is write-protected or if there is no FLASH part (System uses a PROM or EPROM).

Microcode Error

BIOS could not find or load the CPU Microcode Update to the CPU. This message only applies to INTEL CPUs. The message is most likely to appear when a new CPU is installed in a system board with an outdated BIOS. In this case, the BIOS must be updated to include the Microcode Update for the new CPU.

NVRAM Checksum Bad, NVRAM Cleared

There was an error in while validating the NVRAM data. This causes POST to clear the NVRAM data.

Resource Conflict

More than one system device is trying to use the same non-shareable resources (Memory or I/O).

NVRAM Ignored

The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST.

NVRAM Bad

The NVRAM data used to store Plug'n'Play (PnP) data was not used for system configuration in POST due to a data error.

Static Resource Conflict

Two or more Static Devices are trying to use the same resource space (usually Memory or I/O).

PCI I/O conflict
A PCI adapter generated an I/O resource conflict when configured by BIOS POST.

PCI ROM conflict
A PCI adapter generated an I/O resource conflict when configured by BIOS POST.

PCI IRQ conflict
A PCI adapter generated an I/O resource conflict when configured by BIOS POST.

PCI IRQ routing table error
BIOS POST (DIM code) found a PCI device in the system but was unable to figure out how to route an IRQ to the device. Usually this error is causing by an incomplete description of the PCI Interrupt Routing of the system.

Timer Error
Indicates an error while programming the count register of channel 2 of the 8254 timer. This may indicate a problem with system hardware.

Interrupt Controller-1 error
BIOS POST could not initialize the Master Interrupt Controller. This may indicate a problem with system hardware.

Interrupt Controller-2 error
BIOS POST could not initialize the Slave Interrupt Controller. This may indicate a problem with system hardware.

CMOS messages

CMOS Date/Time Not Set
The CMOS Date and/or Time are invalid. This error can be resolved by readjusting the system time in AMIBIOS Setup.

CMOS Battery Low
CMOS Battery is low. This message usually indicates that the CMOS battery needs to be replaced. It could also appear when the user intentionally discharges the CMOS battery.

CMOS Settings Wrong
CMOS settings are invalid. This error can be resolved by using BIOS Setup.

CMOS Checksum Bad
CMOS contents failed the Checksum check. Indicates that the CMOS data has been changed by a program other than the BIOS or that the CMOS is not retaining its data due to malfunction. This error can typically be resolved by using BIOS Setup.

Miscellaneous messages

Keyboard Error
Keyboard is not present or the hardware is not responding when the keyboard controller is initialized.

Keyboard/Interface Error
Keyboard Controller failure. This may indicate a problem with system hardware.

System Halted
The system has been halted. A reset or power cycle is required to reboot the machine. This message appears after a fatal error has been detected.

Troubleshooting

First steps

Warning

To avoid bodily injury, do not attempt to troubleshoot your server problem if:
- The power cords or plugs are damaged
- Liquid has been spilled into your server
- Your server was dropped
- The case was damaged

Instead, unplug your server and contact a qualified computer technician.

Try these steps first before going to the following sections:

- Make sure that the power cords are connected to your server and an AC outlet and that the AC outlet is supplying power.
- If you use a surge protector or a UPS, make sure that it is turned on and is rated to handle the power required by your server.
- If you added or removed server components before the problem started, review the installation procedures you performed and make sure that you followed each instruction. You may need to remove the device, uninstall the device's software, then reinstall the device.
- If an error message appears on the screen, write down the exact message before calling Gateway Customer Care. For instructions, see "Telephone support" on page 62.
- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Check your configuration settings.
- When diagnosing problems, press the non-maskable interrupt (NMI) button to put the server into a halt state. For the location of the button, see "Control panel" on page 2.
- If an error occurs in a program, see its documentation or online help.

Battery replacement

If you have problems after installing a new CMOS battery, try each of the following items, closing the case and restarting the server after each try:

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Correct any discrepancies.
- Remove the back top panel by following the instructions in "Opening the server case" on page 25, then make sure that all cables inside the case are attached securely. Also, make sure that the colored cable edges are aligned correctly and that the connectors do not miss any pins.
- If you have the correct test equipment, make sure that the new battery has power. Although unlikely, your new battery may be defective.

Beep codes

Whenever a recoverable error occurs during the power-on self-test (POST), the BIOS displays an error message that describes the problem. The BIOS also sounds a beep code (one long tone followed by two short tones) during POST if the video configuration fails (a faulty video controller) or if an expansion card is not functioning correctly. One short beep indicates the BIOS will boot the operating system. No error found.

A PCI expansion card (for example, a RAID controller) can also issue audible errors by itself, usually consisting of one long tone followed by a series of short tones. For more information on the beep codes issued, check the documentation for that device.

The following table shows POST error beep codes. Prior to system video initialization, BIOS uses these codes to inform you of error conditions.

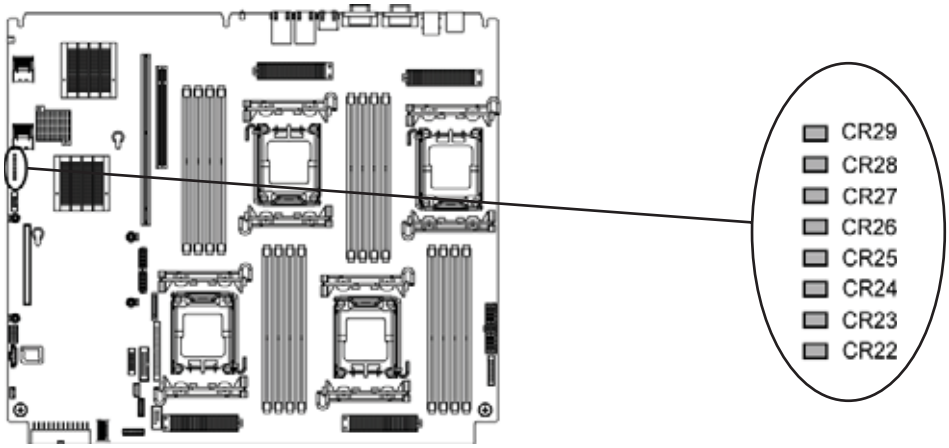
Beeps	Description	Troubleshooting steps
1	Memory refresh timer error	Reseat the memory modules or replace with modules you know are good.
2	Parity error in the first 64 KB of memory.	Same as for 1 beep.
3	Base memory read/write test error	Same as for 1 beep.
4	System board timer not operational.	Possible system board malfunction. To eliminate the possibility of an add-in card problem, remove all expansion cards. If the beep code occurs even when all expansion cards have been removed, the system board is at fault. If the beep code does not occur when the expansion cards have been removed, one of the cards is causing the problem. Install the cards one at a time until the problem happens again. When the beep code returns, the most recent card you installed is at fault.
5	A processor on the system board generated an error.	Remove one of the processors if two are installed, then try a known good processor in the first socket. Same as for 4 beeps.
6	The keyboard controller (8042) may be defective. The BIOS cannot switch to Protected mode.	Remove the keyboard to see if the error goes away. If it does, try a known good keyboard. Same as for 4 beeps.
7	General exception error (processor exception error).	Same as for 5 beeps
8	Display memory error (system video adapter).	If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is integrated into the system board, the board may be faulty. Try using an add-in card.
9	The ROM checksum value does not match the value encoded in the BIOS.	Same as for 4 beeps.
10	The shutdown register for CMOS RAM failed.	Same as for 4 beeps.
11	The cache memory test failed.	Same as for 4 beeps.

Diagnostic LEDs

This system board provides a set of eight diagnostic (Port 80) LEDs. If you are troubleshooting your system, these LEDs can help you determine where errors are taking place.

If you are experiencing problems with your server, open the case and check these LEDs (CR22 to CR29) on the system board, then check the tables on the following pages to determine the problem.

The location of Port 80 LEDs is shown in the following illustration:



The eight diagnostic LEDs are divided into two groups. LEDs from CR22-CR25 comprise one group, and LEDs from CR26-CR829 comprise the other group. The two groups represent the two digits of the hex code. The CR22-CR25 group stands for the first digit and the CR26-CR29 group stands for the second.

Hex Code	CR22	CR23	CR24	CR25	Hex Code	CR26	CR27	CR28	CR29
	8	4	2	1		8	4	2	1
0	0	0	0	0	**0**	0	0	0	0
1	0	0	0	1	**1**	0	0	0	1
2	0	0	1	0	**2**	0	0	1	0
3	0	0	1	1	**3**	0	0	1	1
4	0	1	0	0	**4**	0	1	0	0
5	0	1	0	1	**5**	0	1	0	1
6	0	1	1	0	**6**	0	1	1	0
7	0	1	1	1	**7**	0	1	1	1
8	1	0	0	0	**8**	1	0	0	0
9	1	0	0	1	**9**	1	0	0	1
A	1	0	1	0	**A**	1	0	1	0
B	1	0	1	1	**B**	1	0	1	1
C	1	1	0	0	**C**	1	1	0	0
D	1	1	0	1	**D**	1	1	0	1
E	1	1	1	0	**E**	1	1	1	0
F	1	1	1	1	**F**	1	1	1	1

In determining the code, Off = 0 and On = 1. Based on this, you can determine the corresponding hex code. Then, by checking "POST code checkpoints" on page 70, "Bootblock initialization code checkpoints" on page 72, "Bootblock recovery code checkpoints" on page 73, "DIM code checkpoints" on page 74, and "ACPI runtime checkpoints" on page 74, you can find out where an error is taking place.

For example, if a hex code of 0B is indicated, you can detemine that the server cannot detect the PS/2 mouse. You can then take measures, such as reinserting the mouse, to solve the problem.

All LEDs are cleared and restored to normal status after the server is power cycled.

POST code checkpoints

The following table shows the checkpoints, LED codes, and task description of events that may occur during the POST portion of the BIOS:

Check point	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initialize data variables that are based on CMOS setup questions. Initialize both the 8259 compatible PICs in the system.
05	Initialize the interrupt controller in hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Trap INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initialize the CPU. The BAT test is being done on KBC. The keyboard controller command byte is being programmed after Auto detection of KB/MS using AMI KB-5.
C0	Early CPU Init Start — Disable Cache - Init Local APIC
C1	Set up boot strap processor information.
C2	Set up boot strap processor for POST.
C5	Enumerate and set up application processors.
C6	Re-enable cache for boot strap processor.
C7	Early CPU Init Exit.
0A	Initialize the 8042 compatible keyboard controller.
0B	Detect the presence of PS/2 mouse.
0C	Detect the presence of keyboard in KBC port.
0E	Testing and initialization of different input devices. Also, update the Kernel Variables. Trap the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.

Check point	Description
2A	Initialize different devices through DIM. See "DIM code checkpoints" on page 74 for more information.
2C	Initialize different devices. Detects and initializes the video adapter installed in the system that has optional ROMs.
2E	Initialize all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initialize the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM-specific information.
38	Initialize different devices through DIM. See "DIM code checkpoints" on page 74 for more information.
39	Initialize DMAC-1 and DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, press **DEL** or **ESC** keys to limit memory test. Display total memory in the system.
3C	Mid-POST initialization of chipset registers.
40	Detect different devices (parallel ports, serial ports, and coprocessor in CPU, and so on) successfully installed in the system and update the BDA, EBDA, and so on.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size, if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initialize NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initialize IPL devices controlled by BIOS and option ROMs.
7A	Initialize remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display error to the user and gets the user response to error.
87	Execute BIOS setup if needed/requested.
8C	Late POST initialization of chipset registers.
8D	Build ACPI tables (if ACPI is supported).
8E	Program the peripheral parameters. Enable/disable NMI as selected.
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to operating system.

Check point	Description
A2	Take care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft® IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display, if needed.
A4	Initialize runtime language module.
A7	Display the system configuration screen, if enabled. Initialize the CPUs before boot, including the programming of the MTRRs.
A8	Prepare CPU for operating system boot, including final MTRR values.
A9	Wait for user input at config display, if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. De-initializes the ADM module.
AB	Prepare BBS in Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Pass control to OS Loader (typically INT19h).

Bootblock initialization code checkpoints

The Bootblock initialization code sets up the chipset, memory, and other components before system memory is available. The following table provides the diagnostic LED code for these checkpoints and describes the type of checkpoints that may occur during the bootblock initialization:

Check point	Description
Before D1h	Early chipset initialization is done. Early super I/O initialization is done, including RTC and keyboard controller. NMI is disabled.
D1	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	Go to flat mode with 4 GB limit and GA20 enabled. Verify the bootblock checksum.
D2	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	Test base 512 KB memory. Adjust policies and cache first 8 MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.
D6	Both key sequence and OEM-specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0. See Bootblock Recovery Code Checkpoints section of document for more information.
D7	Restore CPUID value back into register. The Bootblock-Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.

Check point	Description
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1 MB Read-Write, including E000 and F000 shadow areas, but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See "POST code checkpoints" on page 70 for more information.

Bootblock recovery code checkpoints

The bootblock recovery code gets control when the BIOS determines that a BIOS recovery needs to occur because the user has forced the update or the BIOS checksum is corrupt. The following table provides the diagnostic LED codes for these checkpoints and describes the type of checkpoints that may occur during the Bootblock recovery portion of the BIOS:

Check point	Description
E0	Initialize the floppy controller in the super I/O. Some interrupt vectors are initialized. DMA controller is initialized. 8259 interrupt controller is initialized. L1 cache is enabled.
E9	Set up floppy controller and data. Attempt to read from floppy.
EA	Enable ATAPI hardware. Attempt to read from ARMD and ATAPI CDROM.
EB	Disable ATAPI hardware. Jump back to checkpoint E9.
EF	Read error occurred on media. Jump back to checkpoint EB.
E9 or EA	Determine information about root directory of recovery media.
F0	Search for pre-defined recovery file name in root directory.
F1	Recovery file not found.
F2	Start reading FAT table and analyze FAT to find the clusters occupied by the recovery file.
F3	Start reading the recovery file cluster by cluster.
F5	Disable L1 cache.
FA	Check the validity of the recovery file configuration to the current configuration of the flash part.
FB	Make flash write-enabled through chipset and OEM-specific method. Detect correct flash part. Verify that the found flash part size equals the recovery file size.
F4	The recovery file size does not equal the found flash part size.
FC	Erase the flash part.
FD	Program the flash part.
FF	The flash has been updated successfully. Make flash write-disabled. Disable ATAPI hardware. Restore CPUID value back into register. Give control to F000 ROM at F000:FFF0h.

DIM code checkpoints

The Device Initialization Manager (DIM) gets control at various times during BIOS POST to initialize different system buses. The following table describes the main checkpoints where the DIM module is accessed.

Checkpoint	Description
2A	Initialize different buses and perform the following functions: ▪ Reset, Detect, and Disable (function 0) — Disables all device nodes, PCI devices, and PnP ISA cards. It also assigns PCI bus numbers. ▪ Static Device Initialization (function 1) — Initializes all static devices that include manual configured onboard peripherals, memory and I/O decode windows in PCI-PCI bridges, and noncompliant PCI devices. Static resources are also reserved. ▪ Boot Output Device Initialization (function 2) — Searches for and initializes any PnP, PCI, or AGP video devices.
38	Initialize different buses and perform the following functions: ▪ Boot Input Device INitialization (function 3) — Searches for and configures PCI input devices and detects if system has standard keyboard controller. ▪ IPL Device Initialization (function 4) — Searches for and configures all PnP and PCI boot devices. ▪ General Device Initialization (function 5) — Configures all onboard peripherals that are set to an automatic configuration and configures all remaining PnP and PCI devices.

ACPI runtime checkpoints

ACPI checkpoints are displayed when an ACPI-capable operating system either enters or leaves a sleep state. The following table describes the types of checkpoints that may occur during ACPI sleep or wake events:

Checkpoint	Description
AC	First ASL checkpoint. Indicates that the system is running in ACPI mode.
AA	System is running in APIC mode.
01, 02, 03, 04, 05	Entering sleep state S1, S2, S3, S4, or S5.
10, 20, 30, 40, 50	Waking from sleep state S1, S2, S3, S4, or S5.

BIOS

The settings in the BIOS Setup utility are not retained

- Replace the CMOS battery. For instructions, see "Replacing the CMOS battery" on page 49.

Optical drive

Your server does not recognize an optical drive

- Restart your server, then open the BIOS Setup utility by pressing and holding **F2** while your server restarts. Make sure that the IDE controllers are enabled. For more information, see "Using the BIOS Setup Utility" on page 53.
- Reinstall the device driver. For instructions, see *Using Your Server Companion DVD*.
- Make sure that the drive is configured correctly by following the instructions in the drive's documentation.
- Turn off your server, then remove the drive and push it in again to make sure the drive is seated correctly. For instructions, see "Removing and installing an optical drive" on page 28.

Your optical drive tray does not open

- Press a straightened paper clip wire into the optical drive's manual eject hole. The drive tray opens.
- If this problem happens frequently while the server is turned on, the drive may be defective.

Expansion cards

Your server does not recognize an expansion card

- Restart your server.
- Make sure that you have installed the necessary software or driver. For instructions, see the card's documentation.
- Reseat the expansion card and riser card. For instructions, see "Installing and removing PCI expansion cards" on page 34.
- If another slot of the correct size is available, install the card in a different slot.

Hard drive

The hard drive cannot be accessed, or you receive a "General failure reading drive C" error message

- If a diskette is in the diskette drive, eject it and restart your server by pressing the reset button.
- Restart your server by pressing the reset button.
- Turn off your server, then remove all hard drives and push them in again to make sure the drives are seated correctly. For instructions, see "Removing and installing a hard drive" on page 29.
- If your server has been subjected to static electricity or physical shock, you may need to reinstall the operating system.

You receive a "Non-system disk" or "disk error" error message

- Eject the diskette from the diskette drive (if installed), then press **ENTER**.
- Make sure that your hard drive has an active partition. For more information, see "The master boot record is corrupted" on page 76.

You are having problems with a SATA drive

- For normal SATA drives (not SATA RAID), check the BIOS setup utility to see if the BIOS has recognized the drive.
- Make sure that the power cable and SATA cables are attached securely to the drive cage.
- If the drive is not detected, try a different SATA port.
- Try swapping SATA cables between drives to determine if the cable is defective.
- Try listening to the drive to determine if the drive is spinning up. If not, the drive may be defective.

The master boot record is corrupted

- In a Windows network operating system, repair the master boot record using FDISK.

To repair the master boot record:

- At a DOS command prompt, type **fdisk/mbr**, then press **ENTER**.

■

Internet

See also *Modem*.

You cannot connect to the Internet

- Make sure that your account with your Internet Service Provider (ISP) is set up correctly. Contact your ISP technical support for help.

Keyboard

Liquid has been spilled into the keyboard

- If you spilled liquid in the keyboard, turn off your server and unplug the keyboard. Clean the keyboard and turn it upside down to drain it. Let the keyboard dry before using it again. If the keyboard does not work after it dries, you may need to replace it. This type of damage is not covered by your server's warranty.

LED information

See "LED information" on page 8 for a description of this server's LEDs and the information they provide.

Memory

Memory errors were detected during server start up

- Open your server and make sure that the memory modules are installed correctly. For instructions, see "Installing memory" on page 31.
- A memory module may be defective. If possible, try another memory module and see if the error repeats.

Monitor

Your server is running but there is no picture

- Adjust the brightness and contrast controls to the center position.
- Make sure that the monitor is plugged in and turned on. If the monitor is turned on, the power LED should be lit.
- Check the port and cable for bent or damaged pins.
- Connect your monitor to another computer, or connect a monitor that you know works to your server.

The color is not uniform

Make sure that the monitor warms up for at least 30 minutes before making a final judgment about color uniformity.

Make sure that:

- The monitor is not positioned too close to another monitor, electric fan, or fluorescent light.
- You demagnetize the screen using the monitor's degauss feature. For more information on degauss, see the monitor's documentation.

A horizontal line or wire is visible across the CRT monitor screen

The monitor may use thin *damper* wires, located approximately 1/3 of the way from the upper and lower screen edges, to stabilize the internal aperture grille. These wires are most obvious when the monitor displays a white background. The aperture grille allows more light to pass through the screen for brighter colors and greater luminescence. The damper wire is a critical part of the overall monitor design and does not negatively affect the monitor's function.

Power

You press the power button, but the server does not turn on

- If the power button LED is green, the server is turned on, but you may not be seeing an image on the monitor. For monitor troubleshooting, see "Monitor" on page 76.
- If your server is plugged into a surge protector or UPS, make sure that the surge protector or UPS is connected securely to an electrical outlet, turned on, and working correctly. One way to check this is to plug the server directly into a wall outlet, bypassing the surge protector or UPS.
- Make sure that the electrical outlet is working by plugging a working device, such as a lamp, into the outlet, then turning it on to test the outlet.
- Open your server and make sure that the power supply module cage cable is connected correctly to the system board.

When you turn on the server, it makes several short beeps

- The short beeps indicate the server has encountered some type of error. See "Beep codes" on page 67.

Processor

Your server does not recognize a new processor

- Make sure that the processor is fully seated in its socket. The processor should be recognized automatically if it is installed correctly.
- If you have upgraded your server from one processor to two, you may need to reconfigure your operating system so it recognizes the additional processor. For instructions, see your operating system's documentation.

APPENDIX A
Server Specifications

- System specifications
- System board specifications
- Environmental specifications
- Electronic specifications
- Additional specifications

System specifications

Case size	5.12 × 17.56 × 27.56 inches (13.0 × 44.6 × 70.0 cm)
Weight	Minimum - 79.37 lbs (36 Kg) (no bezel, power supplies, hard drives, optical drive, fans, cables, and so on) Maximum - 99.21 lbs (45 Kg) (±0.5 Kg)
Fans	▪ Five dual-rotor, multi-speed system fans
Ports	▪ PS/2 keyboard or mouse (2) ▪ USB (4 standard, 2 front and 2 back) ▪ Serial ▪ VGA (2 standard, 1 front and 1 back) ▪ LAN (4) (RJ-45) ▪ IPMI (RJ-45) for BMC
Drives (standard)	▪ One slimline drive bay for an optical drive
Hard drive bays	Twelve SATA or SAS hot-swap hard drive bays
Card sizes	Riser card assembly supports three full-length, full-height and two low-profile PCI expansion cards
Power supply	Three 700 W hot-swap, redundant power supply modules (standard)
Operating systems	Supports Windows Server 2003 (all) and Windows Storage Server 2003 (all)
Certifications	▪ FCC Class A ▪ UL ▪ cUL

System board specifications

Processor	Quad 1207-pin socket F Supports as many as four AMD Opteron 8000 Series processors with 1.0 GHz Hyper Transport Bus
Chipset	▪ nVIDIA nFORCE 3600 (MCP55 Professional) ▪ nVIDIA nFORCE 3050 (IO55) ▪ NEC PCI-X bridge uPD 720404
Memory	Sixteen DIMM slots support from 1 GB to 64 GB total memory Use only 184-pin, DDR2-533/667 compliant, ECC, registered, 72-bit, single rank or dual rank, SDRAM modules. **Caution** - When using Dual Rank (double row) DIMMs, a maximum of four loads per memory channel is supported. This means a maximum of four dual rank DIMMs can be populated on this system board.
PCI device/slot	▪ Riser 1 supports - one full-length, full-height 64-bit PCI-X 100 MHz card and two PCI-Express cards ▪ Riser 2 supports - two low profile PCI-Express cards.
VGA	▪ Integrated Matrox G200 Graphics Core with 2.25 MB ▪ Up to 1280 × 1024, 8 bpp or 1024 × 768, 16 bpp

LAN	▪ nVIDIA MCP55 and IO55 ▪ Four onboard 10/100/1000 network interface ▪ Supports teaming, load-balancing, failover, TOE, and jumbo frame
ACPI	ACPI 2.0b compliance Supports: ▪ S0 ▪ S1 ▪ S5

Environmental specifications

The following specifications identify maximum environmental conditions. At no time should the server run under conditions which violate these specifications.

Variable	Requirements
Temperature	Nonoperating: -40° to 158°F (-40° to 70°C) Operating: 50° to 95°F (10° to 35°C) with a maximum rate of change not to exceed 10° per hour
Humidity	Nonoperating: + 10% to +95% Operating: +20% to +80%
Acoustic noise	Sound Pressure: 58 dBA (Rackmount) in an idle state at typical office ambient temperature. (73.4 +/- ° F) Sound Power: 6.8 BA in an idle state at typical office ambient temperature. (73.4 +/- 3.6° F)
Shock	Operating - 5.0 g, 11 mSec, 1/2 sine Unpackaged - 25 g, velocity change 136 inches/sec (≧ 40 lbs to > 80 lbs). Packaged - Non-palletized free fall in height 24 inches (≧ 40 lbs to > 80 lbs)
Vibration	Unpackaged - 5 Hz to 500 Hz, 2.20 g RMS random
Electrostatic discharge (ESD)	+/-15 kV, air discharge +/- 8 kV direct contact
System cooling requirement in BTU/Hr	7140 BTU/hour (Based on one 700W power supply module)

Electronic specifications

Memory map

Address Range (hex)	Amount	Function
0 to 07FFFFh	640 KB	DOS region, base system memory
0A0000h to 0BFFFFh	128 KB	Video or SMM memory
0C0000h and 0DFFFFh	128 KB	Expansion card BIOS and buffer area
0E0000h to 0FFFFFh	128 KB	System BIOS

Address Range (hex)	Amount	Function
0E0000h to 0EFFFFh	2 MB	Extended system BIOS
FC000000h to FFFFFFFFh	64 MB	PCI memory space

Interrupts

Important
If you disable an IDE controller to free the interrupt for that controller, you must physically unplug the IDE cable from the system board. Simply disabling the drive by configuring the BIOS option does not make the interrupt available.

The following table reflects a typical configuration, but you can change these interrupts. Use this information to determine how to program each interrupt.

ISA Interrupt	Description
IRQ0	8254 timer
IRQ1	Keyboard controller
IRQ2	Cascade for IRQ9
IRQ3	Free
IRQ4	Serial port
IRQ5	VGA
IRQ6	Diskette controller
IRQ7	Free
IRQ8	Real-time clock
IRQ9	Generic, Option for SCI
IRQ10	USB controller
IRQ11	LAN
IRQ12	Mouse controller
IRQ13	Numeric data processor
IRQ14	Primary IDE controller
IRQ15	Free

Connector pinouts

Main power connector (J48)

Pin	Signal Name
1	+3.3 V
2	+3.3 V
3	Ground

Pin	Signal Name
4	+5 V
5	Ground
6	+5 V
7	Ground
8	Power good
9	Stand by +5 V
10	+12 V
11	+12 V
12	+3.3 V
13	+3.3 V
14	-12 V
15	Ground
16	DC_ON (soft on/off)
17	Ground
18	Ground
19	Ground
20	Key
21	+5 V
22	+5 V
23	+5 V
24	Ground

Processor power connector (J1)

Pin	Signal Name
1	Ground
2	Ground
3	Ground
4	Ground
5	+12 V1
6	+12 V1
7	+12 V2
8	+12 V2

VGA connector

Pin	Signal Name
1	Red
2	Green
3	Blue
4	No connection
5	GND
6	GND
7	+5 V
8	GND
9	+5 V
10	GND
11	No connection
12	SDA
13	HSYNC (horizontal sync)
14	VSYNC (vertical sync)
15	SCL

Serial port connector

Pin	Signal Name	Description
1	DCD	Data Carrier Detect
2	RXDATA	Receive Data
3	TXDATA	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

Keyboard and Mouse connectors

Pin	Signal Name
1	Keyboard (or mouse) data
2	NC

Pin	Signal Name
3	GND
4	+5 V
5	Keyboard (or mouse) clock
6	NC

External USB connectors

Pin	Signal Name
1	+5 V
2	USB*n* Data-
3	USB*n* Data+
4	GND

I^2C (SMBus) connector

Pin	Signal Name
1	I^2C SCL
2	I^2C SDA
3	I^2C Alert
4	Ground
5	+3.3 V

Additional specifications

For more information about your server, such as memory size, hard drive size, and processor type, visit Gateway's *Support* page at support.gateway.com. The *Support* page also has links to additional Gateway documentation and detailed specifications for your server.

APPENDIX B
BIOS Settings

If you ever need to restore your BIOS settings, such as after a system board change, a record of the settings will make the process much easier. You can print this appendix, then record your custom BIOS settings on the printout. Only settings which can be changed are listed. For a complete list of viewable BIOS settings, run the BIOS Setup utility.

▶ **To view all BIOS settings:**

1. Restart your server
2. Press **F2** when the Gateway logo screen appears during startup. The BIOS Setup utility opens.
3. Select menus and submenus to display setting information.

■

Caution
Setting the wrong values in the Advanced Menu may cause the server to malfunction.

BIOS menu	BIOS submenu	Setting	Value
Main			
		System Overview AMIBIOS (Version, Build date, System ID, Version), Processor (Type, Speed, Count)	
		System Memory (Size)	
		System Time	HH:MM:SS
		System Date	DAY MM/DD/YYYY
Advanced			
	CPU Configuration	Module Version	
		Physical count	
		Logical count	
		Manufacturer and type	
		Revision	
		Cache L1	
		Cache L2	
		Speed	
		Current FSB Multiplier	
		Maximum FSB Multiplier	
		Able to Change Freq.	
		uCode Patch Level	
		GART Error Reporting	Enabled Disabled
		Microcode Update	Enable Disable
		SVM	Enable Disable

BIOS menu	BIOS submenu	Setting	Value
		ACPI 2.0 Object	Enable Disable
	Memory Configuration		
		Total Memory Capacity	
		IOMMU Mode	AGP Present Disabled 32MB 64MB 128MB 256MB 512MB 1GB
		Memory Hole Remapping	Enabled Disabled
		CS Sparing Enable	Enabled Disabled
		DIMM Information	
			CPU0 Size of Dimm #A0 (Size or Non-Presence) Size of Dimm #B0 (Size or Non-Presence) Size of Dimm #A1 (Size or Non-Presence) Size of Dimm #B1 (Size or Non-Presence)
			CPU1 Size of Dimm #A0 (Size or Non-Presence) Size of Dimm #B0 (Size or Non-Presence) Size of Dimm #A1 (Size or Non-Presence) Size of Dimm #B1 (Size or Non-Presence)
			CPU2 Size of Dimm #A0 (Size or Non-Presence) Size of Dimm #B0 (Size or Non-Presence) Size of Dimm #A1 (Size or Non-Presence) Size of Dimm #B1 (Size or Non-Presence)
			CPU3 Size of Dimm #A0 (Size or Non-Presence) Size of Dimm #B0 (Size or Non-Presence) Size of Dimm #A1 (Size or Non-Presence) Size of Dimm #B1 (Size or Non-Presence)
	IDE Configuration		
		OnBoard IDE Controller	Disabled Enabled
		OnBoard SATA Controller	Disabled Device 0 Device 0/1 Device 0/1/2
		Primary IDE Master	(auto-detected) Selects IDE Configuration sub-menu.
		Primary IDE Slave	(auto-detected) Selects IDE Configuration sub-menu.
		MCP55 SATA 0 Primary	(auto-detected) Selects IDE Configuration sub-menu.

BIOS menu	BIOS submenu	Setting	Value
		MCP55 SATA 0 Secondary	(auto-detected) Selects IDE Configuration sub-menu.
		MCP55 SATA 1 Primary	(auto-detected) Selects IDE Configuration sub-menu.
		MCP55 SATA 1 Secondary	(auto-detected) Selects IDE Configuration sub-menu.
		MCP55 SATA 2 Primary	(auto-detected) Selects IDE Configuration sub-menu.
		MCP55 SATA 2 Secondary	(auto-detected) Selects IDE Configuration sub-menu.
		IO55 SATA 0 Primary	(auto-detected) Selects IDE Configuration sub-menu.
		IO55 SATA 0 Secondary	(auto-detected) Selects IDE Configuration sub-menu.
		IO55 SATA 1 Primary	(auto-detected) Selects IDE Configuration sub-menu.
		IO55 SATA 1 Secondary	(auto-detected) Selects IDE Configuration sub-menu.
		IO55 SATA 2 Primary	(auto-detected) Selects IDE Configuration sub-menu.
		IO55 SATA 2 Secondary	(auto-detected) Selects IDE Configuration sub-menu.
		Hard Disk Write Protect	**Disabled** Enabled
		IDE Detect Time Out (Sec)	0, 5, 10, 15, 20, 25, 30, **35**
		ATA(PI) 80Pin Cable Detection	Host & Device Host Device
	Super I/O Configuration		
		Onboard Floppy Controller	Disabled Enabled
		Floppy A	Disabled 1.44 MB 3½" 2.88 MB 3½"
		Serial Port 1 Address	Disabled 3F8 2F8 3E8 2E8
		Serial Port 1 IRQ	IRQ3 IRQ4 IRQ10 IRQ11
		PS/2 Keyboard	Present
		PS/2 Mouse	Present

BIOS menu	BIOS submenu	Setting	Value
	USB Configuration		
		USB Devices Enabled (List of USB devices detected by BIOS)	
		Legacy USB Support	Disabled Enabled **Auto**
		USB 2.0 Controller Mode	FullSpeed (12 Mbps) **HiSpeed** (480 Mbps)
		BIOS EHCI Hand-Off	Disabled Enabled
	PCI Configuration		
		OnBoard VGA	Disabled **Enabled**
		OnBoard NIC1	Disabled **Enabled**
		OnBoard NIC2	Disabled **Enabled**
		OnBoard NIC3	Disabled **Enabled**
		OnBoard NIC4	Disabled **Enabled**
		OnBoard NIC PXE Function	Disabled **Enabled**
		PCIX Daughter Card Option ROM	Disabled **Enabled**
		GW MzBoard Option ROM	Disabled **Enabled**
		Full Height Riser Slot	Installed
		PCIe Top Slot Option ROM	Disabled **Enabled**
		PCIe Middle Slot Option ROM	Disabled **Enabled**
		PCI-X Bottom Slot Option ROM	Disabled **Enabled**
		Low Profile Riser Slot	Installed
		PCIe Top Slot Option ROM	Disabled **Enabled**
		PCIe Middle Slot Option ROM	Disabled **Enabled**

BIOS menu	BIOS submenu	Setting	Value
Boot			
	Boot Settings Configuration		
		Quick Boot	Disabled **Enabled**
		Quiet Boot	**Disabled** Enabled
		Bootup Num-Lock	On Off
		POST Error Pause	Disabled **Enabled**
Security			
		Supervisor Password (Installed/Not installed)	
		User Password (Installed/Not installed)	
		Change Supervisor Password (Set or clear Supervisor password)	
		User Access Level	No Access View Only **Limited** **Full Access**
		Change User Password (Set or clear User password)	
		Password Check	**Disabled** Enabled
		Boot Sector Virus Protection	**Disabled** Enabled
		Power & Reset Switches Inhibit	**Disabled** Enabled
		NMI control switch inhibit	**Disabled** Enabled
Server			
	System Management		
		Restore on AC Power Loss	Last State
		Install OS	Windows/Other
		Wake on Ring Function	Enabled **Disabled**
		Plug & Play BMC detection	Enabled **Disabled**
	Remote Access Configuration		

BIOS menu	BIOS submenu	Setting	Value
		Remote Access	Disabled **Enabled**
		Serial Port Number (Base address and IRQ)	COM1
		Serial Port Mode	115200 8,n,1 57600 8,n,1 19200 8,n,1 09600 8,n,1
		Flow Control	None Hardware Software
		Redirection After BIOS POST	Disabled Boot Loader Always
		Terminal Type	ANSI VT100+ VT-UTF8
		VT-UTF8 Combo Key Support	Disabled **Enabled**
	IPMI Configuration		
		Status of BMC	
		BMC Firmware Revision	
		View BMC Event Log	Provides data on event log
		Clear BMC System Event Log	
		Disable PEF	**No** Yes
	Restore on AC Power Loss		Power Off Power On Last State
	Wake on RING function		**Disabled** Enabled
Exit			
		Save Changes and Exit (**F10**)	
		Discard Changes and Exit	
		Discard Changes	
		Load Optimal Defaults	
		Load Custom Defaults	
		Save Custom Defaults	

This second level submenu is accessed from the submenu indicated in the first column.

BIOS submenu	BIOS 2nd level submenu	Setting	Value
IDE Configuration			
	Primary IDE Master (All IDE drives)	(Below is shown information and options appropriate to drive type)	
		Device	Device information
		Vendor	Device vendor
		Size	Device size
		LBA Mode	Device LBA mode
		Block Mode	Device block mode
		PIO Mode	Device PIO mode
		Async DMA	Device Async DMA mode
		Ultra DMA	Device Ultra DMA mode
		S.M.A.R.T.	Device S.M.A.R.T. support
		Type	Not Installed **Auto** CD/DVD ARMD
		LBA/Large Mode	Disabled **Auto**
		Block (Multi-Sector Transfer) Mode	Disabled **Auto**
		PIO Mode	**Auto** 0 1 2 3 4
		DMA Mode	**Auto** SWDMA 0-2 MWDMA 0-2 UWDMA 0-6
		S.M.A.R.T.	**Auto** Disabled Enabled
		32Bit Data Transfer	**Disabled** Enabled

APPENDIX C
Legal Information

Important safety information

Warning
Always follow these instructions to help guard against personal injury and damage to your Gateway system.

Your Gateway system is designed and tested to meet the latest standards for safety of information technology equipment. However, to ensure safe use of this product, it is important that the safety instructions marked on the product and in the documentation are followed.

Setting up your system

- Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.
- Do not use this product near water or a heat source such as a radiator.
- Set up the system on a stable work surface.
- The product should be operated only from the type of power source indicated on the rating label.
- If your computer has a voltage selector switch, make sure that the switch is in the proper position for your area. The voltage selector switch is set at the factory to the correct voltage.
- Openings in the computer case are provided for ventilation. Do not block or cover these openings. Make sure you provide adequate space, at least 6 inches (15 cm), around the system for ventilation when you set up your work area. Never insert objects of any kind into the computer ventilation openings.
- Some products are equipped with a three-wire power cord to make sure that the product is properly grounded when in use. The plug on this cord will fit only into a grounding-type outlet. This is a safety feature. If you are unable to insert the plug into an outlet, contact an electrician to install the appropriate outlet.
- If you use an extension cord with this system, make sure that the total ampere rating on the products plugged into the extension cord does not exceed the extension cord ampere rating.
- If your system is fitted with a TV Tuner, cable, or satellite receiver card, make sure that the antenna or cable system is electrically grounded to provide some protection against voltage surges and buildup of static charges.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill anything on the system.
- Some products have a replaceable CMOS battery on the system board. There is a danger of explosion if the CMOS battery is replaced incorrectly. Replace the battery with the same or equivalent type recommended by the manufacturer. Dispose of batteries according to the manufacturer's instructions.
- When the computer is turned off, a small amount of electrical current still flows through the computer. To avoid electrical shock, always unplug all power cables and modem cables from the wall outlets before cleaning the system.

Warning
This unit has two power supplies. To remove power from all internal circuitry you must disconnect both power cords.

- Unplug the system from the wall outlet and refer servicing to qualified personnel if:
  - The power cord or plug is damaged.
  - Liquid has been spilled into the system.
  - The system does not operate properly when the operating instructions are followed.
  - The system was dropped or the cabinet is damaged.
  - The system performance changes.

Replacement parts and accessories

Use only replacement parts and accessories recommended by Gateway.

Warning
To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.

Important
Do not use Gateway products in areas classified as hazardous locations. Such areas include patient care areas of medical and dental facilities, oxygen-laden environments, or industrial facilities.

Regulatory compliance statements

United States of America

Federal Communications Commission (FCC) Unintentional emitter per FCC Part 15

FCC Part 15 Class A Statement

The server is designated as complying with Class A requirements if it bares the following text on the rating label:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

Caution
Changes or modifications not expressly approved by Gateway could void the FCC compliance and negate your authority to operate the product.

Telecommunications per FCC part 68 (applicable to products fitted with USA modems)

Your modem complies with Part 68 of the Federal Communications Commission (FCC) rules. On the computer or modem card is a label that contains the FCC registration number and Ringer Equivalence Number (REN) for this device. If requested, this information must be provided to the telephone company.

An FCC-compliant telephone line cord with a modular plug is required for use with this device. The modem is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68-compliant. See installation instructions for details.

The Ringer Equivalence Number (REN) is used to determine the number of devices which may be connected to the telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

If this device causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. The telephone company may request that you disconnect the equipment until the problem is resolved.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

This equipment cannot be used on telephone company-provided coin service. Connection to party line service is subject to state tariffs. Contact the state public utility commission or public service commission for information.

When programming or making test calls to emergency numbers:

- Remain on the line and briefly explain to the dispatcher the reason for the call.
- Perform such activities in the off-peak hours such as early morning or late evenings.

The United States Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains, in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, an identification of the business, other entity, or other individual sending the message, and the telephone number of the sending machine or such business, other entity, or individual. Refer to your fax communication software documentation for details on how to comply with the fax-branding requirement.

FCC declaration of conformity

Responsible party:

Gateway Companies, Inc.
610 Gateway Drive, North Sioux City, SD 57049
(605) 232-2000 Fax: (605) 232-2023

Product:

- Gateway E-9722R Server

For unique identification of the product configuration, please submit the 10-digit serial number found on the product to the responsible party.

This device complies with Part 15 of the FCC Rules. Operation of this product is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution
Changes or modifications not expressly approved by Gateway could void the FCC compliance and negate your authority to operate the product.

Canada

Industry Canada (IC)
Unintentional emitter per ICES-003

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par Industrie Canada.

Telecommunications per Industry Canada CS03
(for products fitted with an IC-compliant modem)

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operation, and safety requirements. The Department does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should make sure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Warning
To avoid electrical shock or equipment malfunction do not attempt to make electrical ground connections by yourself. Contact the appropriate inspection authority or an electrician, as appropriate.

Users should make sure, for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Laser safety statement

All Gateway systems equipped with CD and DVD drives comply with the appropriate safety standards, including IEC 825. The laser devices in these components are classified as "Class 1 Laser Products" under a US Department of Health and Human Services (DHHS) Radiation Performance Standard. Should the unit ever need servicing, contact an authorized service location.

Warning
Use of controls or adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure. To prevent exposure to laser beams, do not try to open the enclosure of a CD or DVD drive.

California Proposition 65 Warning

Warning
This product contains chemicals, including lead, known to the State of California to cause cancer and/or birth defects or reproductive harm.

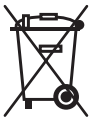
Environmental information

The product you have purchased contains extracted natural resources that have been used in the manufacturing process. This product may contain substances known to be hazardous to the environment or to human health.

To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, Gateway provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

Waste Electrical and Electronic Equipment (commonly known as WEEE) should never be disposed of in the municipal waste stream (residential garbage collection). The "Crossed-Out Waste Bin" label affixed to this product is your reminder to dispose of your "end of life" product properly.

Substances such as glass, plastics, and certain chemical compounds are highly recoverable, recyclable, and reusable. You can do your part for the environment by following these simple steps:



- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- In some cases, your "end of life" product may be "traded in" for credit towards the purchase of new Gateway equipment. Call Gateway to see if this program is available in your area.
- If you need further assistance in recycling, reusing, or trading in your "end of life" product, you may contact us at the Customer Care number listed in your product's user guide and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly.

With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.

Notices

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Irvine, CA 92618-2930 USA

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